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*Education
and
Human Resource
Development*

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**Education
and
Human Resource
Development**

V. K. R. V. RAO



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DEDICATED

TO

DR. SARVAPALLI RADHAKRISHNAN

A great educationist and humanist

WITH

respects and regards



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Introduction

It has long been recognised by economists that human factor is a major instrument in economic growth and that human resource development should figure prominently in plans and programmes for economic and social development. However, it is only recently that this recognition is getting extended to the planners in the developing countries of Asia, Africa, and Latin America. The Indian Planning Commission has been no satisfactory exception to this statement.

As an economist and an educationist with some experience in the running of educational institutions, I have long been pleading for greater importance being given to human resource development in Indian planning. My inclusion in the Indian Planning Commission about three years ago gave me the opportunity to develop my interest further in this subject. The responsibility for educational planning with which I was entrusted within the Commission has made me keenly aware of the relation between education, human resource development and economic growth, and I have tried my best to influence educational development in the Fourth Plan in the direction of a greater degree of orientation to the requirements of India's developing economy. In view of the need for eliciting public understanding and cooperation in the new orientation sought to be given to Indian education, I have ventured to share with my Indian readers the logic and reasoning behind this re-orientation. I am also not without hope that this volume may prove of interest to educationists and planners in the other developing countries, as they are also faced with a similar problem of turning their educational programmes into a major instrument for human resource development in their own countries.

The volume is divided into six parts : it has two appendices. The first part deals with the general problem of human resource development in relation to economic growth. The second takes up

the more specific question of man-power planning for this purpose. The third brings in the role of education in this context and deals with its more generalised aspects in relation to economic and social development. The fourth part is concerned with the role of higher education in facilitating and accelerating economic development, while the fifth is devoted to what I call the technology of education with the accent on improvement of efficiency and economy in expenditure. The sixth part deals more exclusively with some Indian problems, namely, the problems of language and of youth with special reference to emotional integration. The first appendix reproduces my address to a Conference of State Education Ministers held in June 1965 and contains my thinking on educational policies and priorities in India's Fourth Plan. The second appendix carries twelve tables and two graphs. All the parts bear evidence of concern with the Indian situation and Indian problem, but the first five have been so drafted as to provide some interest to the non-Indian reader in the other developing countries of the world.

In conclusion, it must be emphasised that this is not an academic treatise nor a work of scholarly research. It is based on the long experience and scattered thinking over the years of an economist, who has also had to function as an educationist and more recently as a planner. Much of what is contained in this volume has found expression in many articles and addresses before professional and non-professional audiences. They have now been revised, edited, and brought together in an integrated form, but nevertheless, they bear the mark of their original provocation. Above all, the intention is to address the lay reader and the professional educationists and planners and not the sophisticated economist. The object is to share one's ideas on educational planning as a means for human resource development, with the accent on practical considerations and workable programmes rather than on abstract theories or sophisticated reasoning.

I must thank my friend Prof. M.N. Srinivas, the eminent sociologist, for the care with which he has gone through my manuscript and suggested changes that have added to both economy and purposiveness in the text. I must also thank my young

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colleague, Dr. S.N. Saraf of the Education Division in the Planning Commission, without whose enthusiastic and constant prodding I would not have gone in for the publication of this volume.

New Delhi
31st March 1966

V.K.R.V. RAO



PART ONE

*Human
Resource
Development*

Planning for the Better Utilisation of Human Resources

The question is sometimes asked as to why the less developed countries should go in for economic planning when so many of the developed countries have succeeded in developing their economies without having done so. There are several reasons why planning is considered a necessary instrument for economic growth by the less developed countries like, for example, India. The major reason is the low level of their current economic development and the large leeway they have to make up because of their many decades of backwardness. This requires a rate of growth that is much higher than would be the case if consumption, savings, investments, imports, and utilisation of human resources were left to take their natural or unregulated and unplanned course. Thus, without planning, luxury consumption would be larger, savings would be smaller, investments would be dominated by considerations of short period profit and not oriented to economic growth, imports would contain a larger element of luxury and conventional consumption goods and therefore less of capital goods, raw materials and of goods and services designed to increase the productivity of the economy, while human resources would either remain largely under-utilised or unutilised or utilised in a manner that will not maximise their contribution to the growth potential. Planning is needed to increase the rate of saving, and to reorient investment in a direction that would increase capital formation and the rate of growth as also the flow of consumption goods and services. It is also required to take stock of the nation's human resources, project demands for the quantum and types of skills needed for development and take the action necessary to convert the raw human material into the technical and other skilled manpower which is necessary for increasing productivity and accelerating economic growth. Planning thus means not only putting

in the necessary material inputs but also securing their most effective utilisation.

Utilisation is a crucial factor in determining the extent and pace of economic development. Sometimes planners are so apt to be carried away by the importance of material inputs and physical capital formation that they seem to think that economic development just means the creation of irrigation, power, transport, mining capacity, coal, steel, fertilisers and machine building capacity. Undoubtedly all these are necessary; but by themselves they do not constitute a sufficient condition for economic growth. (In the last analysis, it is the human being who has to operate these instruments of production. Unless he is equipped with the necessary skills and is motivated to play his appropriate role in production and organises himself properly for the purpose with due regard to economic considerations, the developmental facilities that are created will not be utilised either economically or at their optimum capacity.) Hence my concept of the response ratio of the human factor as one of the major determinants of economic growth. By the response ratio of the human factor is meant, the proportion actually secured of the technically feasible, maximum output of goods and services made possible by available developmental facilities and material inputs. The higher this proportion, the larger is the response ratio of the human factor. It must be added that in judging this response ratio, due account must be taken of the uncontrollable and unpredictable natural phenomena that also play an important role in production, especially in sectors like agriculture. Nor must it be forgotten that the response ratio of the human factor is to be judged not only by the extent to which it makes use of available developmental facilities and material inputs, but also by the extent to which it also increases the supply of these facilities and inputs as it is the latter which determines the path and pattern of long-term growth. In fact, the goods and services produced as a result of the utilisation of the available developmental facilities and material inputs include this element as well, the extent to which it does depending upon the planned target for growth, and the planner's assessment of the comparative psychology and economics of the short and the long period.

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This response ratio of the human factor depends in turn upon the following elements:

- (1) technical skills;
- (2) motivation;
- (3) organisation;
- (4) utilisation of under-employed and unemployed manpower; and
- (5) planning techniques.

Technical skills are now universally recognised as the most important aspect of man-power planning for economic development. A preliminary condition for the building up of technical skills on a massive scale—and one that has been frequently forgotten in many of the developing economies—is the need for securing 100 percent literacy in the population, especially the adults who constitute the human material engaged in productive activity. Literacy in this context does not merely mean imparting the ability to read and write. For aiding development it must involve functional literacy. In other words, the adult whom we seek to make literate must be motivated to do so by the functional knowledge for self-improvement and economic betterment to the locked door of which his newly acquired literacy will be the key. This must be accompanied by the production of the necessary literature in a language simple and easy enough for him to follow; and adequate arrangements should be made to have this literature actually available to him practically at his doorstep. The language used should be the mother-tongue of the adult.

Then comes the actual training of the young in the various skills that are required for development. Education has to be purposive not only in the overall sense of helping to build up the individual's personality, character and intelligence, but also in terms of his productive capacity and his ability to take his due place in the army of workers who have to fight the battle for economic growth. It is therefore that I have been emphasising for some time a new slogan for education, namely, that education must be work-oriented, development-biased, and linked with productive capacity. This means in turn that education should be science-based almost

from its elementary stage and provide both for knowledge of the environment and some kind of production-oriented activity. Emphasis should be on the activity aspect of the work undertaken by children rather than on the economic aspect as was mistakenly stressed in the Indian attempts at basic education. It would be useful to take the help of audio-visual and modern teaching techniques in this connection.

It is also necessary to recognise that all children do not need facilities for training up to the highest educational stages either from the point of view of their own personal development, or from that of satisfying the needs of the economy. It is therefore necessary to provide for terminal points at various stages of education as also for diversification of courses at other than the elementary stage. Terminal points are needed at the post-elementary, the post-secondary, and the post-collegiate, stages with continuation courses in craftsmanship, agriculture, technology, commerce, nursing, and other avenues for employment after the post-elementary or the post-secondary stage as is warranted in each individual case. In order to provide opportunities for improvement in qualifications of those who take to employment either at the post-elementary or post-secondary or even the post-graduate stages, the educational system must provide for part-time institutions, in-service training, and correspondence courses. It must also be recognised that knowledge grows obsolete even when acquired at the highest university stages and needs therefore replenishment as well as modernisation from time to time. For this purpose, it is necessary to provide for refresher courses, orientation courses, summer institute and sabbatical leaves. Only in this manner can we supplement the training received in full-time educational institutions and thereby increase the response ratio of the human factor as well as its optimum utilisation.

Planning for technical skills requires the linking of courses and admissions to man-power requirements. This necessitates projections of demand based upon planned investments, the social development envisaged and the anticipated growth of the economy. These demand-projections for skills have then to be identified in terms of the types of training required, the academic courses they involve, and the number of persons required by different categories

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and the points of time at which they are required. On the basis of the data thus obtained, educational institutions have to be set up or expanded together with the necessary provision for staff, equipment, and construction. Without this type of man-power planning, the nation's human resources cannot be harnessed to take full advantage of the material developmental facilities and physical inputs created by economic planning.

It is not enough, however, to produce skills. Those who acquire skills have to be motivated to use them to their maximum advantage. In fact, motivation comes in even earlier, at the stage when the persons concerned have to be recruited for undergoing the training programme needed for the acquisition of skills.) Motivation is also important for the effective utilisation of the developmental facilities and physical inputs created by the Plans. The question of motivation is particularly important in the case of agriculture not only because of the natural hazards to which it is exposed, the price fluctuations from which it suffers, and the gestation period involved before fructification of its investments, but also because agriculture is the most personalised of all economic activities. Hence the importance of land reforms that will secure to the actual tiller of the soil the bulk of the net profits arising from his increased inputs of work, attention and management, in addition of course to the investment, both current and capital that he makes on the land. For this purpose, ownership of land should vest in the tillage; and where this is not possible in every case, the tenant should have such security of tenure and rent control that for all practical purposes he secures the benefits of ownership without actually being the owner. Land reforms in this complete sense are difficult to implement where the agricultural holdings are small and the number of landlords large as in the case of India, and where further the small tenant is not articulate or organised and enjoys but little economic or social power. India has been trying to deal with these problems and there has been some success in converting tenants into owners and in establishing reasonable conditions of tenancy; but there is no gainsaying the fact that tenurial conditions are still unsatisfactory in many places with resultant adverse effects on motivation, and therefore, production. Even in the case of tillers who own the land or lease it

under satisfactory conditions, the motivation for maximising production is impeded by price fluctuations, and the farmer's long memories of the association between increased output and reduced prices. Thus, for example, the value of agricultural output in one year actually fell in India though its volume had increased by more than 8 per cent. Moreover, as the farmers are large in number and the nature of their industry does not permit flexibility in supply or restriction of output for ensuring more economic prices, they are more reluctant than those engaged in manufacturing industries to go in for capital formation or even increase in their current inputs of working capital. It is therefore necessary for the State to evolve and implement a suitable price policy for agriculture instead of leaving it solely to the mechanism of the market. The most important element of such a policy is a guaranteed support price at which the State or some agency designated by it would be prepared to buy any quantity that the farmer is willing to offer. The level at which this support price is fixed should be realistic and contain the incentive element necessary to serve the purpose of inducing the farmer to go all out to maximise his production without being afraid of its effect on prices. It would also be desirable to guarantee such a price over a period of years so that the farmer would also have the incentive to go in for capital formation and increase the productive capacity of the land that he is cultivating. Indian agricultural planning during the first two Five Year Plans and even later has suffered from a neglect of this important factor of price support as incentive for increasing production and thus led to a lower response ratio of the human factor than would otherwise have been the case. It is a matter for satisfaction that in recent years this neglect has been rectified and Indian agriculture now has support prices that are more realistic than in the past. The Government have also appointed an Agricultural Prices Commission to recommend a scientific price policy geared to production and make concrete suggestions for support prices. On the whole, therefore, India is now moving forward in the direction of better motivation in the field of agricultural production.)

Motivation is also required in regard to maximisation of personal savings, promotion of the investment habit, encouragement of the plough-back of corporate and other business profits, and

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direction of investment into the desired channels. It is also required for the maximisation of exports. On the negative side, motivation is called for to reduce wastage and luxury consumption. Apart from controls and regulations that are aimed at having a direct impact on these factors, the major instruments employed are motivational in the form of tax concessions, and fiscal incentives including subsidies. Indian planning makes large use of such motivational aids for the maximum utilisation of human resources in the desired direction.

Then comes the question of organisation or management. Organisation of both human and material resources has such crucial effects on production that classical political economy has listed it as one of the four principal factors of production. Organisation involves both material and human management. Material management involves decisions on what to produce, how much to produce, and in what way to produce, and among the guiding motives are minimisation of cost, maximisation of net profit, and maintenance of standards. In the actual formulation of production plans, especially on the sectoral and national planes, it is essential to have a firm analysis of inputs and their availabilities, commodity balances, and time balancing of the production of inputs with their utilisation in the making of outputs. Market analysis, cost analysis, input-output analysis, linear and other kinds of programming, and programmes of scientific and technological research, all these constitute part of the task of commodity management, and therefore, of organisation.

Human management also forms an important part of organisation. (As essential condition for successful human management is to see that in filling up jobs, the square peg is placed in the square hole and the round peg in the round hole. This involves a clear formulation of job qualifications and a recruiting machinery that brings to the jobs in question men with the appropriate qualifications. Any sloppiness shown in either of these will lead to mal-utilisation of human resources and therefore result in a reduction in output or a fall in standards or a rise in costs. It is important that those who are employed have adequate motivation to put in their best effort and also improve their qualifications. For this purpose, the method of payment of wages and salaries should be

lined up to the extent possible with increased productivity on the part of the worker. It is also necessary to have suitable programmes of in-service-training that will give opportunities for improvement for the workers who desire to do so and a system of promotion that will provide opportunities for advancement to such workers and others who display exceptional natural or functional talent. This is one of the most important determinants of maximum utilisation of human resources; and every care must therefore be taken to see that in both recruitment and promotion not only are qualifications given predominant weight but facilities also provided for improvement in qualification of those already in service.

Another important component of human management is the machinery provided for decision-making and its implementation in the business unit, industry or economic sector as the case may be. (Decision-making is the most crucial factor in successful management. There must be a line of command, which, in turn, should be linked with a definite authority that can take decisions.) There must also be a line of communication between top management, middle management, and junior management as also with specialised and technical divisions which will clearly indicate the reasoning on which the decision is based and the time table for action, so that the entire organisation is aware of what is being done and why, and can therefore bring to their task not only the discipline of service, but also the knowledge and understanding that comes from conviction and a sense of participation. (It is also important that responsibility is clearly located and accountability individualised.) Where several disciplines or divisions are involved, the machinery of organisation must provide not only for inter-communications, but also for coordination. Implementation, to be efficient and economical, requires advance planning. Advance planning is required not only for anticipating demands and avoiding bottlenecks, but also for dovetailing inter-dependent, complementary and supplementary activities and operations. Follow-up machinery is another important item in implementation, involving allocation of tasks, progress reporting, operation analysis, and timely evaluation. All these aspects of management I have referred to, while literally applicable to individual business units, are also applicable to industries, sectors, and even to the national

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economy as a whole in a society that has taken to planning for its development. In these cases, management has the additional task of bringing about coordination among individual units in any given industry, inter-sectoral balances in the sectors concerned, and overall balances between savings, investments, and other relevant parameters in the case of the national economy as a whole.

Human resource utilisation should also take into account the under-employed and unemployed man-power in the developing economies. As these human beings already constitute a charge on the consumption supplies of the nation, any increase in production resulting from their utilisation should constitute a net gain; and if their services can be used for the creation of capital assets, they would constitute the hidden savings potential to which reference is made by writers on developmental economies. In actual practice, however, there is always a financial outlay involved in putting them to work. What is more important, there is also a real charge which is involved by the net increase in consumption that takes place as a result of their being given employment. Moreover, the types of work that can be given to them are area-bound, and have to take some form of rural works, as they have to continue residing where they were before in spite of their getting employment. Another constraint on the nature of the work they can be given is their lack of technical skills which makes them, generally speaking, available only as unskilled labour. Then there is the cost to be incurred on materials, equipment and supervision. All this qualifies to a large extent the economics of the hidden savings potential that is attributed to under-employed and unemployed man-power. Nevertheless, there is no doubt that there will be a net gain by the utilisation of this labour; and programmes of this kind have to be included in any plan for the better utilisation of human resources. We in India have undertaken a programme of rural works in our Third Plan and are thinking of expanding it during the Fourth Plan. It must be admitted, however, that this programme ran into many initial difficulties, both organisational and otherwise, in the beginning. By now, however, these have been largely met and it is expected that the rural works programme during the Fourth Plan would make some addition to the

national product and capital formation in addition of course to giving some much-needed employment.

Planning techniques constitute an important part of the technology of better utilisation of human resources. Apart from the factors already mentioned, there are certain essential features that characterise good planning. To begin with, it is important to see that the necessary pre-conditions are created for accelerated economic and social growth. These include what are broadly described as economic and social overheads. Economic overheads include transport, irrigation and power, and where technically and economically feasible, also cement, iron and steel, and basic chemicals. Social overheads include general education, science education, technical education, and research. In addition, surveys of natural resources are needed, including soil, water minerals, forests, and marine resources. It is also essential to have the necessary organisation for transmission to the producers, especially in agriculture in the developing countries, technical know-how and improved practices. Organisational requirements also cover the structure of production, especially of cooperatives, availability and proper (possibly supervised) use of credit, appropriate location, timely distribution of inputs, and marketing of products. The fiscal system has to develop both width and depth and, at the same time, contain incentives for enterprise, savings, and investment in the desired direction. Fiscal and monetary policy have also to be built up to contain the inflationary potential that always seems to accompany development, especially in its earlier stages. The vast organisational work and use of man-power that all this involves is a clear indication of the need for the best utilisation of human resources in any plan for massive economic development.

Planning also involves the application of science, logic, and economics in the utilisation of natural resources. Land management, water management, forest management, power management, and transport management all constitute fields which require such planning. Insufficient attention to land management can lead to soil erosion and loss of fertility; to water management, to water logging, salinity, and floods; to forest management to depletion of resources, soil erosion, and floods; to power management to

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uneconomic and mal-utilisation of resources and to transport management to waste, duplication and uneconomic competition.

Planning involves a study of the parameters of the economy, its growth points and leading sectors, its various balances such as export-import balances, commodity balances in inputs and outputs, saving-investment balances, expenditure-income balances, and the inter-connection between units of economic activity that feed each other and can, with planning, lead to massive and self-stimulated growth of judiciously selected but not necessarily large volumes of investment. Foreign exchange balances constitute a crucial constraint on economic development and requires a carefully planned policy of export promotion and import-substitution in order to reduce its influence as a drag on development.

All these factors, so briefly dealt with above, constitute part of the armoury which a planner requires for the better utilisation of human resources. Knowledge, foresight, skills, patience, tenacity, enthusiasm, and responsibility are all qualities that go to make the human resources productive and tend to accelerate development; and so also thrift, enterprise, and willingness to take risks. These are not all inborn or natural qualities. Many of them can be cultivated into becoming massive engines of economic growth. Human resources constitute the most important of all developmental resources; and with skilful management and intelligent planning, they can go a long way in taking a country from underdevelopment to development, from poverty to comfort, and from stagnation to social and economic growth. Not only that; they can also keep the country moving forward on the road to development, continuing progress, and eventual affluence. The more difficult problem is to keep the pace of social and ethical growth in step with the strides of economic progress. But I am afraid that the economist qua economist is not in the best position either by his techniques or by his temper to deal with this problem.

Psychological Aspects of Human Resource Development

As indicated earlier, development is a compound of men and resources. And while capital and technology are both essential for growth, an equally important element is the way the human factor is harnessed for the purpose. Unlike other resources, human resources are almost infinitely elastic. Literacy, education, skills as also health and nutrition, all these undoubtedly add to the efficacy of the human factor. But the human being is more than a mixture of mind and matter. He has a soul, or if you prefer, a conscience. He has values. He dreams of a new and better world, and his dreams have a force and a power that is more than that yielded by many millions of kilowatts of electric power or many thousands of tons of the most complicated machinery. If only we can tap this force, release this idealism and sense of values, and harness it to our development programmes, we will get such a sense of fulfilment in our participation in the growth effort that the whole development process will then become a grand and exciting adventure. The result will be, to use orthodox economic language, a drastic reduction in the disutility and real cost associated with work and saving. In other words, we can then get far more of output in terms of goods and services and of individual and collective welfare than we do now with our limited stock of natural and capital resources.

How can we release this non-material force that can make so much difference to our development effort? I suggest that we cannot do this unless we recognise that development is essentially a psychological phenomenon and that it is possible to build up this psychology even as one can construct a building or put up a factory or erect a dam or bring into existence a new university. Max Weber, and Tawney after him, have told us how protestantism paved the way for the massive economic growth of the western

Psychological Aspects

world in the last two centuries. We all know how the overthrow of feudalism and the attitudes and relations associated with it restored to the human being his sense of innate dignity and furnished the motive force for the vast strides that individual initiative and enterprise have made not only in economic but also in social and scientific development. We are also aware how the early capitalist, unlovely as he sometimes was, nevertheless constituted a progressive force for economic growth by his sense of identification with his work and the subordination of his individual self to the larger purpose of building up his unit of business enterprise. In more recent times, we have seen how a spirit of dedication to what was considered to be the larger social cause on the part of the ruling party has transformed a socially and economically backward society into a modern, developed, and basically progressive nation, within the course of less than two generations. In every case, the secret of success has lain in the free and purposive subordination of the individual to something higher and larger than himself, the institutionalisation of personal ambition or the socialisation of individual talent and incentives. The larger the number of people involved, the smaller the volume of current resources, and the more recent is the attempt at planned development, the greater becomes the necessity for this type of sublimation, and the release and nurture of the psychological forces for development. It is essential for a country going in for planned development to understand and realise the implications of the psychological basis for accelerated growth.

From the psychological point of view, there are three major factors that influence the volume and pace of economic growth, namely, willingness to put in maximum amount of conscientious work, willingness to take risks and show enterprise in seeking opportunities for productive economic activity, and willingness to refrain from consuming a given proportion of the increase in income that accrues from economic development. The sectors involved are, broadly speaking, agriculture, industry, public administration, and the professions. The groups involved are, again in broad terms, owners of property, entrepreneurs, managers and administrators, and workers with varying degrees of skills. These could again be reclassified as the classes and the masses, the latter being much

✓ larger in number but disadvantaged individually in terms of income, levels of living, economic power and opportunity, and productive skills. (Material planning creates opportunities for economic growth; it is the psychological response of the human factor that determines the utilisation of these opportunities and therefore the volume and pace of economic growth.)

Once we realise this basic fact, it becomes clear that the attitudes and behaviour of the human being constitute an important field of study for the planner. (Incentives is the generic expression which is used to indicate the factor that influences behaviour and therefore determines the response ratio of the human being to the opportunities created for economic development.) Unfortunately, in the context of economic development, incentives have become identified with money and individual advancement in material term. Equally unfortunately, the scope of these incentives is largely confined to the leading sectors in economic growth, namely, the middle and the upper classes; and the form it takes is one of individual material advancement. No one quite seems to realise that incentives for the classes may by themselves prove to be disincentives for the masses, and that what we need is a complex of incentives that will motivate both the classes and the masses to play their proper role in speeding up the tempo of economic development. What does not seem to be appreciated is that in developing economies, where the masses constitute the vast majority of the population and provide the bulk of the labour force and earners, there can be no massive development without their active and positive participation in the process of economic growth. Speeches and exhortations apart, one gets the feeling that (economic planning in the developing countries leans heavily on dynamising the classes, leaving to the masses more the role of a sharer and a beneficiary rather than an active and purposive participant.) In small countries which also have smaller mass base of sub-standard levels of living dragging the economy, there is something to be said for using the normal economic incentive of maximising profits and incomes not only because the rungs in the ladder from the bottom to the top are fewer, but also because the pressure of those seeking to climb is less in volume. But this is not true of large countries with a large mass base of abject poverty. There are four large

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countries in the world in the sense that their individual populations exceed 200 millions. One of them has successfully adopted the capitalist way but with an early start, a long period of gestation and abundant natural resources. Two others, which started much later and with a heavy drag of mass poverty, have adopted the communist way, one with success and the other still to achieve it. The capitalist giant has used political democracy and freedom of enterprise to build up its economy; the communist giants are using political dictatorship, economic planning, and a large, disciplined, and dedicated party to build up their economies. The fourth country, namely India, functions under a political democracy, employs economic planning, and uses both the public sector and the private sector to build up its economy. The incentives used are largely drawn from capitalist economies but have to function in India within the context of planning and its controls and a pronounced bias for the public sector. At the same time, India has not succeeded in drawing the masses into playing a positive role in the growth process. No doubt the classes are growing in strength and in numbers and the masses are recording some improvement in their levels of living, but the economic and social ladder is tall, the rungs are many and their spacing is wide, and the immensity of the mass base of poverty acts as a drag on our attempts at individual economic betterment. Under these circumstances, the prospects of India's economic growth with stability and development with freedom seem to me to be dependant upon the extent to which we re-examine the psychological foundations of our economic planning, realise the integral place of social policy and development in economic growth, and re-arrange our armoury of incentives and values in such a manner as will release mass energy, stimulate mass participation, and motivate mass involvement in the development process.

First and foremost, we have to restore to the individual among the Indian masses a sense of human dignity and social equality. It is true, he has been given political equality and this is proving to be an instrument for stimulating his desire for dignity and self-respect as also for social and economic equality. But unless social policies and institutions give him the opportunity for fulfilling these

desires, what is being built up is only a mass force that will prove explosive one day and threaten the continuity of democratic development. Untouchability has been abolished by the Constitution; and special budgetary provisions are being made for the welfare and development of the scheduled castes and scheduled tribes. But this does not mean that caste Hindu society has given these fellow Indians a real sense of equality. Worse still, there is no active public opinion worrying itself about this problem and going all out to speed up the process of social equality and social development, especially in rural India. Passing laws and spending money by the Government are both no doubt useful; but even more important is the change displayed by the caste Hindus in their daily attitudes and behaviour towards these historical relics of caste inequality. The scheduled castes and scheduled tribes in India number nearly 100 millions and unless they are given a social status and a sense of belonging, there are bound to be difficulties in both the pace and the stability of Indian development. This involves more than action by Government. But Government machinery can do a lot if its personnel is permeated with the spirit of the Constitution in regard to the backward classes. Voluntary agencies can also make their contribution, and especially students, if they take the lead by setting an example by their social behaviour and even more by their active and positive support for the implementation of the Constitution in regard to the backward classes. It is not only the backward classes and the so-called untouchables who need to be given a sense of human dignity and social equality. The whole caste system is an anachronism that is a standing slur on the Indian attempt at achieving social equality and promoting social development. In addition, the country is cluttered with many feudal relics and attitudes that have no place in a democratic, let alone a socialist, society. The question to ask is what is being done to build up a system of values that are rooted in dignity and individual human worth? Show pieces and special concessions are not the answer. What is needed is introspection and self-examination on the part of the socially privileged sections of Indian society, and following it, a wholesale change in entire attitude to the weaker and backward sections of the people.

Psychological Aspects

Another condition for mass participation is giving to tillers rights of ownership which will involve them in a total way in the maximisation of agricultural output. Land to the tiller is a principle that has been implemented even in a land-starved and capitalist country like Japan. The developing economies have to implement this principle not only on paper but in actual practice. Cooperative farming could also be a way of building up self-reliance, facilitating the mobilisation of resources and economic holdings in agriculture, and forging a link between land and the large number of tillers who either do not own it or do so in pitifully small holdings. The psychological impact of these measures on production is unquestionable and they need as much attention as the creation of material inputs if we want to involve the masses in our development programmes.

It is also important to create a psychology of self-reliance among the rural masses if development is to proceed on an enduring and expanding basis. This is not possible in the absence of adult literacy, a vast programme of book production in the regional languages and a reorientation of the educational system to serve the needs of the rural areas in terms of modernisation and the application of science and technology. In the absence of all this, what emerges is not the growth of self-reliance and mass involvement in development, but the emergence of an agitational approach to economic problems and the building up of an increasing reliance on Government and governmental aid which is unhealthy. Socialism does not mean statism, certainly not in the context of a democratic and free society. And unless plans and policies result in self-reliance and self-help on the part of the masses of our people, such development as is achieved by State initiative, government machinery and participation by the *elite* and the better-off among the people will not succeed in either solving the problem of mass poverty or creating a feeling of mass participation and mass involvement in the development process. It is time that planners re-examined economic policies and programmes from this angle and gave more attention to the social and human aspects of development planning.

A disquieting feature in the development that is taking place in most of Asia and Africa is the way an *elite* class is being built,

not on the basis of service or sublimation of personal ambition, but on that of monetary rewards and personal advancement. While monetary incentives have their place in the psychological armoury for inducing greater effort, exclusive reliance on them in countries with a vast mass base of poverty only results in widening the cleavage between the masses and the classes, between the town and the country, between the backward and the forward regions, and between the *elite* and the others. In India, this is helping to dilute the satisfaction that should otherwise accompany the undoubted economic progress achieved in aggregate terms, weakening the forces of national unity and emotional integration, and leading to the growth of a class consciousness that will soon make nonsense of the efforts at building up a socialist society by consent and evolution. Once we in India have established self-respect, human dignity, social equality and self-reliance among the masses of our people, especially those who live in our villages, broken the back of our mass poverty and set up an effective economic ladder, then it would be time for monetary incentives to be given a dominant role in stimulating the dynamism of those who have the gifts for innovating, diversifying, and expanding our production apparatus. Till then, the incentive offered to these economic builders has to be different. Their satisfaction will have to come largely from their identification with mass uplift, their sense of social values, their feeling of pride and fulfilment in developmental effort, and their patriotism and love for India. These qualities were more than abundantly displayed by the Indian *elite* during the fight for our national freedom as also during the subsequent threats to freedom by foreign aggression. It should not be impossible to revive these qualities in the longer and harder battle that has to be waged against poverty and the absence of human dignity, self-respect and social equality among the vast masses of their fellow citizens. In this again, the lead has to come from the educated youth of the country whose skills and participation the nation requires for its economic development.

My Indian readers will forgive me for this emotional approach from a fellow Indian who claims to be an economist. It is surprising that we do not have in India that much of voluntary effort on the part of those who are better placed or otherwise advan-

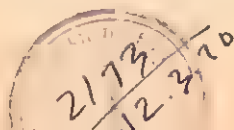
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taged, as one would expect from the national heritage of sacrifice, austerity and spirituality. Some of the great institutions which made a name for their voluntary work like the Servants of India Society or the Servants of People Society are today languishing for want of fresh membership. Even the Ramakrishna Mission, which is doing such splendid work in the field of social service, is not able to cope with the many demands made upon it because of want of new recruits. The younger generation seems indifferent to motivations other than those of personal advancement. The fault undoubtedly lies largely with those who belong to the older generations. Instead of re-grouping for battle and reinforcing the social urges and idealistic fervour that inspired their struggle for national independence, they got bogged in statecraft, politics, planning, and undue reliance on governmental institutions and machinery. They forgot the crucial role of the people, of values, of social and national urges, and of idealism and voluntary action that alone can lead to the next victory of building up the good society for which political independence was but a prelude. Someone said the other day that we are undergoing a crisis of confidence, but I would say that we are going through a crisis in values. Must economic development mean motivation of the classes only through economic incentives? If it does, I am afraid, we will not have either economic development on the scale that is needed, nor will it have that flavour that comes from its contribution to the implementing of human values. I refuse to believe, however, that the fountains of idealism have dried up in the country or that only monetary rewards can move the *elite* and the gifted among our people. I have the faith that those who are young and on the threshold of active and purposive life in new India will have the vision and the impulse to pick up the thread where Swami Vivekananda and Mahatma Gandhi left it. It is the student community alone that can restore idealism to Indian life, revive the missionary spirit of service and sacrifice and join the front line of those who want to wage war on poverty without either increasing economic inequality or widening social disparity or releasing forces that will make for class consciousness and eventual class conflict. India means her masses and patriotism means their service. As Swami Vivekananda said long ago:

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“It is a man-making religion that we want. It is man-making theories that we want. It is man-making education round that we want.” And man-making does not only mean making men of ourselves, but also the making of men of those who today lead sub-human lives in their levels of living and in their capacity to effect a significant improvement therein on their own. In a vast and poor country like ours, the *elite* have a much greater public role than elsewhere; and their lives need to be dictated much less by personal or private consideration. What was first said in the *Bhagawad Gita* so many thousands of year ago holds true today with even greater force :

यद्यदाचरति श्रेष्ठस्तत्तदेवेतरो जनः ।

स यत्प्रमाणं कुरुते लोकस्तदनुवर्तते ॥

✓ For whatsoever a great man does, that very thing other men also do; whatever standard he sets up, the generality of men follow the same.

What I have said above is there not only for India but also for most of the other developing countries in the contemporary world, where economic growth is leading to the emergence of an *elite* class, rich, often efficient, but mostly unrelated to the masses of their countries by either a feeling of identification or a spirit of voluntary service.

PART TWO

*Man-power
Planning*



Man-power Planning and Economic Growth

Economic growth is a complex affair that involves many factors, some passive and others active, some inter-dependent and others autonomous, and some controllable and predictable while others are 'acts of gods', and therefore, neither controllable nor predictable. Further, economic growth is only a means to an end which is social welfare with the result that attention has to be paid not only to material goods and the services ancillary thereto but also to educational, health and other services which go into direct consumption. Outputs are thus in terms of both goods and services which are either capital or intermediate or final in character. In turn, these outputs involve inputs which take the form of both commodities and services. Input of services is just another way of describing man-power utilisation and hence the relevance of man-power planning in the strategy for economic growth.

The problem of man-power planning is not peculiar only to less developed countries but is also found in the developed countries, especially in these days of rapid technological progress and the widening influence of automation in many sectors of economic activity. But it is more urgent in the case of less developed countries, for without the provision of man-power inputs of adequate magnitude, relevant quality and appropriate timing, economic growth does not get a chance to get going. In a less developed country, there is need not only for increasing current output but also bringing about bigger increases in future outputs. Whereas the former may be dealt with by import of technical know-how and foreign man-power, even this is limited in scope for both economic and political reasons; while the latter cannot be solved without resort to some kind of planning for obtaining domestically the needed supplies and kinds of man-power. Man-power planning becomes a little *less* difficult when the developing country is planning its economic growth rather than leaving it to the free

play of economic forces. When a country goes in for economic planning, as, for example, India has done through its Five Year Plans, it means that we project in advance what goods and services we want to produce at the end of a given time span. Though targets are fixed for a five-year period, it must be remembered that planning is a continuous process and projects have long gestation periods. The results achieved in any one plan-period therefore are in part the result of investments undertaken in a previous period, while part of the investments undertaken during a current plan period spill over into the succeeding Five Year Plan. That is why India has perspective planning for 15 or 20 or 25 years with Five Year Plans dovetailed into each other for achieving results spread over the entire period.

Given the targets, man-power planning takes the form of identifying the man-power outputs required in some detail in respect of the skills involved, the numbers needed, and their distribution over time. Account has to be taken not only of the types of training required to produce the necessary skills and the number of institutions that have to be set up for the purpose, but also of the time needed to set them up, train the staff needed for these institutions and train the personnel who have trained this staff. All this indicates the vital importance of the time element in man-power planning. Indeed, one may well apply to this field the analogy drawn from industrial planning of consumption goods and capital goods or machinery for making the final product and machinery for making this machinery. In turn, this means that man-power planning implies not only projections of demand and identification of the personnel needed, but also careful assessment of the time span over which its training has to be spread. Failure to take action in this respect in the field of supply will bring about imbalances in the equation of man-power and lead to bottlenecks, unemployment and shortfalls in output. Advance planning is thus part of the essence of man-power planning.

Two specific points have to be made in regard to the training programmes formulated for producing the necessary skills. The first is in regard to the duration of training programmes. All training programmes need not be full time courses spread over a long period nor need they be aimed at imparting the total skill

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needed for the targeted production of goods and services. A good deal of the required skills can be acquired only after employment and familiarity with the job. Moreover, skills acquired through primary training programmes suffer obsolescence, and need to be renewed and brought up-to-date. All this means that man-power training programmes must also include part-time courses, sandwich courses, refresher courses, orientation courses, and in-service training. The other point to remember is that specialisation has also got its dangers. While specialised training is undoubtedly necessary for producing the different types and grades of skills needed for development, the nature of the advance that is taking place in scientific and technological knowledge is such that it involves not only specialisation but also integration. Under the circumstances, full time educational training must lay stress on a strong base of fundamental knowledge and refrain from over-emphasising narrow specialisation. The educational system must leave some room for specialisation to be acquired by in-training and other types of training programmes following formal education.

In addition to this strictly planning aspect of man-power in relation to projected needs as determined by developmental policy, it is also necessary for the less developed countries to make an attempt at utilising their vast resources of idle man-power, which constitutes one of their principal developmental assets. Idle man-power, which includes both unemployed, under-employed, and disguisedly employed man-power, has long been recognised in the literature on economic development as a potential source of capital formation and economic growth; and various attempts have been made in the less developed countries to tap this source. The assumption here is that as the living costs of idle man-power are already a charge on the nation's annual output, the cost to society in putting them to work is much less than would be the case otherwise. If the employment given to them is directed at the creation of capital assets, then not only does it add to capital formation but also results in a permanent rise in the employment potential in the economy as well as a rise in productivity. All the same, as discussed earlier, there are some doubts about the validity of the assumption that there is no net

social charge for their maintenance after employment. Nevertheless, it also constitutes a part of man-power planning in the case of the less developed countries.

We may now turn to Indian experience in the field of man-power planning. The Five Year Plans are drawn up with targets of output and the investments required to achieve them. Thus the first three Five Year Plans had before them targets of overall economic growth of twelve per cent, twenty-five per cent and thirty per cent respectively, with investment outlays amounting to Rs. 35,000 millions, Rs. 62,000 millions and Rs. 104,000 millions respectively over the three Plan periods. The Plans included not only targets of growth in commodity output, power, transport, and communication, but also in the social services such as education and medical facilities, and institutional services such as agricultural extension and community development, cooperation and local self-government. The first thirteen years of planning have seen a growth in national income of 58.5 per cent, while the indices of agricultural production, mineral output, manufacturing and electricity have increased by 47 per cent, 82 per cent, 137 per cent and 388 per cent respectively. On the side of social and institutional services, the number of students at the school and college stages of education has increased by 150 per cent, and 200 per cent respectively, that of admissions to technical institutions for craftsmen training by about 800 per cent, for engineering diplomas by 515 per cent, for engineering degrees by 395 per cent and for medical colleges by 210 per cent. The number of factory and mine workers has increased by 40 per cent; and that of Government employees by 61 per cent (between 1956 and 1964). The anticipated results at the end of the Third Five Year Plan are somewhat higher than the figures given above, while the targets under discussion for the Fourth Five Year Plan aim at a significant and in some cases even a spectacular stepping up of the rate of growth in the country's social and economic development.

All this necessarily involves a transformation of unskilled into skilled labour and the conversion of raw human material into the types and numbers needed for economic development. Targets of skilled man-power have had to be formulated and with it also the action programmes necessary for the realisation of these man-

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power targets. The first attempt ever made in India to assess requirements of technical personnel over a given period and plan for the necessary training facilities was made by the Scientific Man-power Committee, shortly after Independence in 1947-48. Subsequently, committees and working groups have been set up by the Planning Commission from time to time to consider the problems of technical, vocational, medical, educational and administrative personnel from the points of view of both supply and demand and formulate targets and programmes of development. Work has also been undertaken in this regard in the various divisions of the Planning Commission, the Directorate of Man-power in the Central Ministry of Home Affairs, and in the Institute of Applied Man-power Research which functions under the Ministry. Man-power cells have been also set up in the State Governments to aid in the process. On the basis of all this material, man-power programmes are included in the Plans under different sectoral heads and necessary funds included in the Plan investment and the current outlays linked with the investment.

The targets for technical personnel are worked out on the basis of the requirements indicated by the Plan's investment programmes. Norms are established linking up investment with technical personnel to the maximum possible extent on the basis of types of investment programmes and broken up into craftsmen, diploma holders and degree holders. To the total numbers thus arrived at is added a proportion for wastage and for replacement. This gives us the demand picture. Demand has to be matched with supply by translating into institutional terms, the numbers to be catered for by expansion of existing institutions and by establishment of new institutions. The location of the new institutions in different parts of the country has also to be determined. Then comes the calculation of the numbers and types of equipment needed, construction required not only for housing the training programmes, but also hostels for students, and staff quarters. The number and types of teachers required for running these institutions has to be calculated and this has to include not only the numbers needed for the new and the expanded institutions but also a provision for replacement of those who either die or retire from their teaching and research positions. In turn,

the training programme needed for producing these teachers has to be planned and that means the same kind of calculations all over again but this time in terms of teacher-training institutions, including their number, equipment, location, construction and personnel. In some ways this is the most important exercise in man-power planning; and on the care with which it is done and the efficiency and timeliness of the administrative steps necessary to implement it, will depend the success of man-power planning. In the case of social services like medicine and education, where the targets are determined on the basis of policy decisions, care has to be taken to see that the targets are within the bounds of feasibility in terms of the time taken to train the needed personnel, the numbers that are likely to be available for such training and funds available for the purpose, as also the physical supplies on which a part of the funds will have to be spent. Given the targets or the demand, matching it with supplies follows the same procedure as in the case of technical personnel needed for commodity production.

The following table gives details regarding the demand and supply projections for technical personnel during the Plan periods :

Category	Second Plan 1956-1961		Third Plan 1961-66		Fourth Plan 1966-71	
	Demand	Supply	Demand	Supply	Demand	Supply
Graduates	28,000	26,000	45,000	51,000	75,000	75,275
Diploma holders	54,000	32,000	80,000	80,000	120,000	117,500
* Craftsman	635,000	40,000 to 50,000 Plus@	1,100,000	300,000 plus 800,000	1,600,000	700,000 plus 900,000
@595,000 to 585,000						

* The plus in each case indicates the numbers left to be obtained through traditional and non-institutional training.

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This exercise has to be followed by action to produce the needed supplies of skills. The following table gives details of the action taken in this respect during the first three Plan periods :

<i>Year</i>	<i>Degree Courses</i>			<i>Diploma Courses</i>		
	No of insti- tutions.	Admission capacity	Out-turn	No of insti- tutions.	Admission capacity	Out-turn
1950-51	49	4120	2200	86	5900	2480
1955-56	65	5890	4020	114	10480	4500
1960-61	102	13820	5700	195	25801	8000
1965-66	134	25800*	12000	274	52000*	19000

The emergency caused by the Chinese invasion in 1962 led to an increase in targets. Certain institutions were therefore selected for provision of larger admissions, the duration of the course being simultaneously reduced for entrants with graduate qualifications in science. This is expected to lead to an increase in the intake of degree institutions to 23,130 and in diploma institutions to 47,546. Currently, the Planning Commission has worked out the technical man-power requirements of the economy during the Fourth and Fifth Five Year Plans at 75,500 graduates and 151,100 diploma holders during the former and 127,000 graduates and 254,000 diploma holders in the latter period. To meet these additional requirements, admission capacity for diploma courses is proposed to be increased from 52,000 in 1965-66 to 68,000 in 1970-71 and for degree courses from 25,800 in 1965-66 to 38,900 in 1970-71.

Institutional training provided during the Second Plan period was only for an out-turn of 40,000 to 50,000, the rest being assumed to become available through other means, largely hereditary training and other training programmes. During the Third Plan, institutional training through the Industrial Training Institutes set up by the Labour Ministry was expected to produce an out-turn of 300,000 craftsmen, the rest to be obtained through other means similar to those visualised during the Second Plan

* Approved admission capacity.

period. For the Fourth Plan, Industrial Training Institutes are expected to produce 700,000 craftsmen, the rest to be obtained by other means similar to those visualised during the Second and Third Plan periods. As for craftsmen requirements during the Fifth Plan, a part will be met by new admissions during the last years of the Fourth Plan while the rest will come from admissions during the Fifth Plan, as the duration of the training course is only from 18 months to two years.

Similar steps have been taken for providing the requisite supply of teachers, doctors, para-medical personnel, village level workers, panchayat secretaries, cooperative workers and other administrative personnel; the duration of courses varying from a full time programme of five years to orientation and refresher courses lasting for a few weeks. In order to lessen the pressure on institutions, give facilities to employed persons and also increase the element of practical training, provisions have been made for part-time courses, sandwich courses, and correspondence courses in humanities, pedagogy, science and technology.

It may be useful to list some of the difficulties that have been faced in working out these programmes. Thus there is the wastage caused by failures in examinations, resulting in a larger investment in admissions than is justified by the out-turn. One of the basic problems in man-power planning therefore is to increase the pass percentage without affecting academic standards. A second difficulty arises from shortfalls and over-supplies that take place in subsectoral trained personnel, as it is difficult to anticipate the demand and supplies of such personnel, with precision or in detail. Moreover, the setting up of training institutions in full operational efficiency takes more time than is usually allowed for in projections, staff shortages persist, and equipment is inadequate, with the result that even when the institutions are established and begin producing technical personnel the standards achieved are not wholly satisfactory. Salary scales and conditions of service also constitute an important factor in inducing or deterring required supplies of teaching and research personnel for the institutions in question. Man-power planning has therefore to take into account the measures necessary to attract and retain the teaching personnel without which neither the primary training

nor teacher training can function with efficiency. There is also quite often the problem of attracting the right types of students to take these courses; and hostel facilities, scholarships and other suitable incentives have to form a part of the implementing machinery for man-power schemes.

Finally, in a largely rural country like India, where there also prevails a wide divergency in physical and social amenities between urban and rural areas, it is difficult to induce technical personnel to serve in the rural areas where they are badly needed; compulsion is no answer to this problem, nor appeals and exhortations. Some more material inducements are required to get the required distribution of technical personnel by rural and urban areas and this has to form an integral part of man-power planning in the less developed countries whose rural-urban problems are somewhat similar to ones in India. In spite of all these difficulties, however, it must be pointed out that man-power planning in India, has, on the whole, been one of the successful features of Indian planning. By and large, shortfalls in technical personnel have not hampered the implementation of India's vast investment programmes in the fields of irrigation, power, industry, transport, communication and social development during the last three Plan periods; nor are they likely to do so during the Fourth Plan period. This is the best proof that one can offer of both the relevance and the utility of man-power planning in the economic development of the less developed countries.

Employment and Man-power Planning

According to the best available estimates, the Fourth Plan is expected to start with a backlog of 12 million unemployed persons. Additions to the labour force during this Plan period would be of the order of 23 million persons. Altogether, therefore, there will be 35 million persons for whom employment will have to be found if unemployment is to be completely eliminated during the Fourth Plan period. This, however, is not possible, not only because of inadequacy of financial resources but also because of the inadequacy of resources in terms of trained personnel as well as in terms of organisational ability and the relevant attitudes to work and productivity. It is because of these reasons that the Planning Commission have set before themselves a more modest target of trying to obtain employment during the Fourth Plan period for at least 22 to 23 million persons. This would at least prevent any addition being made to the backlog of the unemployed. The Fifth Plan could then take up the task of eliminating the backlog. Once this is accomplished, it is hoped that the structure of the economy would have been so built that employment will be automatically available for all additions to the labour force as an accompaniment of economic development. It would then be possible to direct attention more and more to raising the levels of earnings of the employed rather than to the problem of finding employment for the unemployed.

Finding employment for 22-23 millions during the Fourth Plan period cannot be done merely by stepping up the tempo of investment or having various development projects in the field of agriculture, industry, mining, transport, etc. These, of course, are necessary but by themselves they will not solve the problem of employment. The solution of the problem of employment requires that the man-power we want to use should be made fit

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for utilisation for the development projects we have in view. In other words, man-power utilisation has got to be linked up with planning man-power training programmes. This includes not only formal education, but also all the other kinds of training programmes including correspondence courses, part-time courses, sandwich courses, evening colleges, in-service training programmes, night schools for industrial workers, etc.

Man-power planning requires reasonably accurate information about the present status of the employed in terms of occupational and industrial classifications, levels of training, and interconnection between these different levels. Having obtained this information, it is necessary to work out norms of the number and categories of persons together with the training required which will be necessary for expansion of activity in the different sectors in the economy and the units constituting those sectors. Projections have to be made on this basis for future requirements and in doing this, attention must also be paid to both existing surpluses and shortages in the economy in different categories of employment and the levels of training required. Once this has been done, we will then have to link up the projected requirement of man-power personnel with the availability and efficiency as well as content of the educational and training programmes which will make projected additions to the man-power utilisable for purposes of meeting the man-power requirements arising from the development programmes included in the Fourth Plan.

India has made considerable progress in organising the machinery for collecting the preparatory data required for man-power planning. Thus, apart from the data that the Census contains which perhaps is not peculiar to this country, we are now obtaining detailed information on the numbers employed and the occupational classifications of the employed persons for all concerns in the public sector and for all concerns in the private sector of units employing 25 persons or more. The total number of persons involved in this process is currently of the order of 13.3 millions, the number of persons belonging to these sectors about whom returns are not received amounting to only 0.7 million out of a total of the 14 million persons employed in this category. We also are now in a position to have this occupational classifi-

cation data not by just broad categories but in detail under 3,600 occupational denominations classified under five-digit "structure", following the ILO pattern with brief definitions of each occupation. Our country, I think amongst all the developing countries, takes an almost unique place in having this national classification of occupations, which has been prepared by the Director General of Employment and Training. This classification has been prepared as a result of job analysis conducted in important establishments throughout the country by trained occupational analysts. Attempts are being made to obtain some information for units in the private sector employing between 10-25 persons and these attempts have been extended to 240 out of 360 districts in the country. Some work has also started on collecting information on employment and occupational classification in units in the private sector employing between 5-10 persons. When these two sets of enquiries have been completed, we should be in a position to account for the total number of employed, their occupational classification and their levels of training, for a labour force which may exceed 25 million persons. We also propose to have a national and comprehensive enquiry into the levels of employment in the country before the end of the Third Plan period. We will then have data of a kind which not many countries including most developed countries could claim to have; and this would give us a first class basis for starting our first exercises on both a comprehensive and a detailed basis of man-power planning for economic development.

Employers and their representatives should lend their full cooperation in the successful implementation of these projects. Better response from employers and prompt rendering of returns will help quicker analysis and a more profitable utilisation of this data for purposes of man-power planning. In particular, it is necessary for employers to see that entries relating to unfilled vacancies and shortages are properly and intelligently filled and for this purpose it may be necessary that the filing of these returns should be entrusted to responsible officials in the units instead of being left to time-keepers as is now often the case. It is also important that the returns should not give vague classifications of occupations such as technical staff, administrative staff, mana-

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gerial staff, etc., but should give details to the maximum extent possible in terms of the national classification of occupations to which I have already referred. It would be helpful if special seminars or instructions programmes are arranged in different parts of the country at which employers' representatives could be given full acquaintance with the national classification of occupations with such logic and details as to make it easier for comprehending and acting upon this classification.

Over and above this bi-annual data that we collect in such detail for occupations both in the public and private sectors, we also get quarterly returns which enable us to record changes in employment by regions and by industries, and also indicate shortages from the returns of unfilled vacancies. This enables us to make the employment market information operational, more useful both to seekers of employment as well as to those who are in charge of training programmes.

What is most necessary for purposes of man-power planning is the establishment of a Cell in every State as well as in all public sector enterprises and as many as possible of enterprises in the private sector whose task would be to make forecasts, however crude they may be, of the additional personnel they would require in relation to the additional development programmes they have. The more comprehensive the preparation of these data and the more closely they are linked up with the national classification of occupations, the more useful it would be to serve as a feeder for the purpose of preparing the educational training programme which alone can supply the bulk of the man-power requirements needed for development. It is of course possible in the Planning Commission or elsewhere in Government to make macro estimates of man-power requirements under broad categories but this would not be adequate in real man-power planning. Real man-power planning, or man-power planning that becomes the basis of policy for training and educational programmes, has to be based on detailed information which can be obtained, only if all the many tens of thousand employers in the country, whether in the public or private sectors, will take the trouble of making some forecasts of their future requirements. This applies not only to employers in the private sector but also to employers in

the public sectors, which means not only public enterprises but also the Central and State Governments, local governments quasi-local authorities as also all educational, medical and other institutions in the broad field of social services. Without having this kind of comprehensive and detailed work, all talk of man-power planning in India will only be an academic exercise. It may secure prestige in international councils but will not give us the basic rewards in terms of better and more productive planning. Work on man-power requirements has to be done in detail by the many tens of thousand employing units in this country. The Central Government and the Planning Commission would be able to assist by coordination of this data, its processing, its analysis and the formulation of meaningful conclusions which will help the employment market, the seekers of employment as well as the suppliers of the training and educational facilities that facilitate employment.

We should realise the cardinal importance of linking the educational system with man-power requirements. It is true that education is a value in itself; but confronted with the imperative demand for acceleration of economic development, and therefore of trained man-power personnel, there can be no two opinions about the need for placing the employment objective in the forefront of the objectives that should underline the programmes and plans for educational development in this country or in other developing countries. All educational programmes, for which resources are required, should be subjected to the test of relevance of the skills and training they impart to the development requirements of the country. There should be a conscious attempt to see that the types of products that we produce from our educational system fit in with the types of requirements of skills and attitudes which our developing economy is faced with. In this connection, we must think not only in terms of educational programmes. We must think even more in terms of the numerous training programmes of which we do not have adequate data today, but which form an important part of the machinery for the training of man-power. There should therefore be not merely a review of all our educational programmes from the point of view of the facilities and balances it provides for trained man-power, but also

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a review of all the training programmes which are in the public sector or the private sector which are directed towards the production of training man-power. Finally, it is important for us to see that right from the beginning, education gets work-oriented and is viewed from the quality of its usefulness for economic development. This is of course obviously necessary for higher stages of education and the need for this is being borne upon us by the large number of educated unemployed. But even more important is the need for having this orientation in middle and secondary education which involves many millions of persons and to which alone for a long time the bulk of the man-power in this country will be getting facilities for education. We have to take a second and a third look at the curriculum, syllabus content, and methods of teaching in our primary, middle and secondary education to see how far these have a built-in content of work-orientation, not so much in terms of actual skills as in terms of attitudes and general familiarity of the connection between education and development. Thus the development of the right attitude to work and the cultivation of an integrated use of the mind, body and heart, must permeate our educational system. If that is now done, the foundations would not have been laid for man-power planning, and if the foundations are not there, any super-structure built thereon, irrespective of the skill and ingenuity with which it is done, is bound to fall.

Role of Guidance in Education

In our country, which is launching upon a huge programme of economic development covering various fields of activities, education has to suit the present and the emerging occupational pattern. This establishes the need for a close link between education and existing and future employment possibilities. In order to tap talent, identify its interest, and develop it on proper lines in relation to the needs of the economy, a massive programme of educational and vocational guidance seems to be imperative. There is also the well-known phenomenon of low achievers with high ambitions and high achievers with low ambitions. For such a category of persons, who form a good size of the student population, an appropriate programme of guidance helps in restoring the balance between the two variables. Moreover, a good deal of industrial inefficiency is attributed to persons having taken up courses not related to their interests or suitable to their abilities. Industrial production and efficiency can increase to the extent it is possible to provide guidance to people to take up careers suited to their aptitudes, capabilities and interests. From this point of view, vocational guidance has an important role to play in the economic growth of the country.

Besides vocational guidance, we also need educational counselling. Our society is in a state of transition, pupils are now being increasingly drawn from areas and classes without educational traditions or familiarity with its discipline, old customs and social safeguards are giving way before the onset of industrialisation, urbanisation, and modernisation, while new habits and safeguards are still in the process of evolution; and traditional values and inherited social relationships are facing attack and erosion. Naturally, therefore, a large section of our student community is feeling bewildered, unsure of itself, and going through alternate moods of diffidence and aggressiveness. Emotional problems

are increasing their frequency among the student community, and being neither identified nor treated, they lead to consequences that startle the teacher and the parent with their antisocial overtones. These are not problems that are peculiar only to a developing society like ours, they also have their place in the developed and affluent societies like those of the U.S.A., the U.K., or even the U.S.S.R. Hence the need for counselling in educational institutions, especially during the adolescence in the later years of the high school and the earlier years of the college. Successful counselling has a great deal to do with social stability and academic efficiency, and therefore with economic growth as well. From this point of view, counselling has an important place in the machinery of our educational institutions.

The need for guidance has been fairly well documented by the studies conducted in the country during recent years. The recent surveys of the employment patterns of graduates and matriculates have highlighted the importance of guidance services. The first such investigation was the Employment Pattern Survey of the Alumni of Delhi University conducted in 1958 by Delhi University in collaboration with the Director General of Employment and Training, and the Planning Commission. The survey indicated that one-third of those who joined the university did not have a vocational aim. In response to the question "Do you think that guidance from a specialist regarding the choice of course or education or career during your student life would have helped you?", nearly 20 to 25 per cent of the graduates expressed the opinion that guidance would have helped them substantially. Another ten per cent thought it would have been of some use. The need was particularly felt by holders of B.A. (Pass), B.Sc. (Pass) and B. Com Degrees. What is more depressing is the fact revealed by the all-India Survey of Graduate Employment which showed that fifty per cent of the employees felt dissatisfied with their jobs. It has also been found that many students who had shown good performance at the school leaving examination failed to maintain consistency of academic record at the degree examination. Among other reasons for this fall in scholastic standard was the wrong choice of subjects at the University. Other surveys have brought out the fact that a large number of matriculates do

not have the required aptitude for the kind of education they go in for in the university. All this highlights the need for educational and vocational guidance at both the secondary and collegiate stages in education.

Another investigation which has pinpointed the need for guidance of university students was carried out by the All India Educational and Vocational Guidance Association recently. A 40-item problem check list was administered to an all-India sample of 3,096 students from 17 universities. Of the 40 problems 11 were marked by more than 50 per cent of students. The problems included lack of information on careers, lack of understanding about one's aptitudes and abilities for different types of work, lack of information about sex, etc. Among the 11 problems which were marked by more than half the group, three related to guidance in vocational matters. The responses to the check list also showed that over 80 per cent of the problems which were marked as troublesome by students were also the problems in which they desired help from their college or university. In another study which was conducted of college students of Bombay University, the students were asked to state reasons for unsatisfactory academic standards in the University. Of the six reasons presented in the questionnaire 81 per cent of the students checked "absence of personal guidance." This reason was second in the magnitude of response, the first being 'over-crowding' which was checked by 80 per cent. Teachers and teaching methods as a cause of unsatisfactory standards was marked by 57 per cent.

Besides such statistical studies of the need for guidance among university students, it is worthwhile to study the problem in the light of the economic, social and cultural changes that are taking place in the country today. Guidance workers cannot fail to appreciate the relevance of socio-cultural factors in the guidance of students. As stated by the eminent American psychologist Gardiner Murphy, "We can no longer use a round-peg-in-round-hole conception of adaptation; the person adapts not to a task but to a social context." This is especially true of India where, as pointed out earlier, our society is in a state of rapid transformation. Guidance workers in India will therefore have to launch investigations into the social and cultural contexts in which problems

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of maladjustments and inefficiency emerge and also use this knowledge for drawing up practical programmes of educational counselling. Particular attention has to be paid to the special problem that arise in the case of the students who either have a predominantly rural background or come from the Scheduled Castes with their inherited experience of long years of social exploitation, or from the tribal classes with their entirely different socio-cultural environment.

The real question, however, is whether guidance services can really be helpful in meeting such problems and if so to what extent, and how. It would indeed be difficult for guidance workers to answer these questions in a categorical manner. However, they should be able to produce evidence based on follow-up studies that the group which has received guidance has fared better on assessable criteria than the one which has not received it. True, there are difficulties involved in evaluating guidance services. And if satisfactory results are not obtained, it is probably more due to difficulties in investigation than in obtaining suitable criteria of adjustment and success. The results of guidance are not as apparent and as spectacular as those, for instance, of medical treatment. As Mathewson says, "The guidance process shares a lack of certainty and precision with other analytical and evaluational procedures in social science." As guidance is concerned with such a difficult intangible as understanding the individual with all his complexities and the environment with all its variety, it is but natural that cent per cent results cannot be expected in guidance. All the same, there can be no denying the value of guidance. Foreign experience gives ample evidence in support of this statement, while even the limited experience that we have in this country also tends in the same direction. Only what is required is more resort to guidance, more knowledge of the problems involved, more research in devising remedial techniques and more skill in both identifying and applying criteria for assessment.

Guidance in the university is only a continuation of guidance in schools. The secret of good education consists in enabling the student to realise what his talents and attitudes are, and in what manner and to what extent he can best develop them so as to achieve proper social adjustment and seek appropriate types of

employment. Generally in all advanced countries there is a tendency to provide identical education to children during the first 7-8 years of schooling. It is presumed that this elementary education should be available to all without any undue specialisation in any field. Various aptitudes and interests manifest themselves prominently towards the end of the period of compulsory elementary education. It is therefore at the post-elementary and at the secondary stage that guidance and counselling of some minimal measures should figure as educational techniques. It also follows that the educational system should provide appropriate facilities for diversion and diversification at the middle and secondary stages or for the age-groups 14 and 16 or 17 depending upon whether the pupil is studying in a high school or a higher secondary school.

The choice, of course, at the post-elementary stage assumes an important dimension, specially because of the fact that our educational system has to be geared to an economy which is steadily becoming diversified. This diversification of the economy that development brings about has also brought in its train the need for modernisation of Indian agriculture, retention of talent in rural areas, and regulation of the increasing migration into the already crowded towns and cities in the country. This development of the economy and the large increase in the number of students seeking admission to secondary schools have altered the character of the demands which secondary education is called upon to meet. New social groups are seeking education and coming within its influence. Expansion has brought into secondary schools a large range of abilities and aptitudes. In the middle and lower grades of many branches of economic life, in administration, rural development, commerce, industry and the professions, the requirements of trained man-power have to be met, after the necessary training, by products of secondary schools. Secondary schools have therefore to be so reorganised that they provide diversified educational service to pupils according to their needs. The successful organisation of secondary education requires the provision of a well-planned programme of educational and vocational guidance which will help parents and pupils in selecting the most satisfying vocation pursuits.

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Guidance is a developmental function and hence can be most effective during the school period which is the most important period for the bulk of our man-power from the developmental point of view. It is concerned not only with enabling the individual to solve his immediate problems as they arise, but also with developing his capacities and psychological resources for dealing with the problems which may arise in future. For the many, it is in the schools, and for a smaller but perhaps more productive number, in the colleges, that the individual and his resources are developed for the life that he will face when he leaves the portals of these institutions. Guidance services are therefore essential in all educational institutions. In fact, one may go to the length of saying there can be no true education without guidance in the modern world with its development diversification and dynamism.

The increasing availability of educational facilities to both boys and girls and also to the backward sections of the community, often in the same campus and buildings are already posing problems which, if not tackled on scientific lines, may lead to maladjustment. One of the important aspects of guidance programme would be the education of the student population in sex relationships. Yet another aspect would be orientation of the students coming from rural areas and backward classes to the new surroundings and altered social relationships, and helping them in getting adjusted to the changed settings. In such cases we have to explore the student's background, find out his fears, doubts and frustrations, get a total view of his personality, and offer him assistance in the handling of the problems that he faces.

Underlying the prevailing educational system there seems to be an assumption that the child's development consists mainly of development of his intellect and his physique. For intellectual development there is instruction in academic subjects and for his physical development there is provision of physical training, games and sports. But, as all educationists and psychologists know, the emotional aspects of the child's personality is crucial for his adjustment to today and also with tomorrow. A healthy emotional development in the formative years is a life-time investment, while disturbances in this area are known to have lasting effects. In the present system of education it seems to be nobody's

concern if a child develops an extremely shy and withdrawn personality, or if he grows up to be a highly aggressive and dominating individual. Similarly, it seems to be nobody's concern if the child grows up into adulthood without acquiring specific employability, or gets into jobs or economic activities for which he is not suited either by interest or by training. This makes nonsense of the claim of education to be an integrating process that makes for the all-round development of the individual. Obviously, we cannot let such a situation continue, nor can we let the emotional development of the student be left just to nature and environment, and not have the benefit that educational guidance and counselling can give him.

However, immediate installation of vocational guidance and educational counselling in all the high schools, higher secondary schools, and colleges in this country is well-nigh impossible. It would be impossible in the near future to have full-time counsellors for each one of the 22,000 secondary schools, and about 2000 colleges in the country—these numbers will inevitably increase in the Fourth Plan—though this would be an ideal solution in view of the importance of the subject. There could, however, be a whole time trained counsellor for a group of schools and colleges in a locality. His advice should be available to the institutions in regard to various aspects of guidance problems, employment opportunities, and training programme. Even for fulfilling this limited objective, we do not have the necessary personnel today in the country. Nor is it either desirable or even practicable to import them in the numbers involved. We have therefore to go in for a substantial training programme and with it must also go largely increased facilities for research, including action-based and operational research.

Pending this, and indeed in addition to this, it would be necessary to arrange for orientation courses for selected teachers from schools and colleges that would familiarise them with some of the basic ingredients of guidance services. Something is better than nothing; and if we can replace the present blank in this matter by at least an awareness of the problem and even a rudimentary knowledge of the elements of the subject, it would mean some advance over the present position. Each school and college should thus

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have at least one teacher who would be able to undertake some work in the field of guidance. It would be necessary to give him an adequate training course of short duration; and it would probably be also necessary to relieve him of his normal teaching load so that he is able to find some time for the work of guidance. In the curriculum of the teachers' training colleges, the subject of educational and vocational guidance would need to be given an important place. The training period should cover the principles and techniques of both educational and vocational guidance. The teachers should be made fully aware of the various tools being employed in assessing the competencies and abilities of the children. The teachers should also be able to help students in the choice of courses, to begin with, towards the end of the middle stage of education. At the next stage i.e. secondary education, the students should be helped in the choice of careers suiting their abilities and also the requirements of the economy. The teachers have to keep a close liaison with employment agencies in order to discharge their duties effectively. To make the programme of educational and vocational guidance effective, it would seem also necessary to arrange meetings, at periodical intervals, between the employment agencies and the heads of colleges and secondary schools. This would promote a closer liaison and relationship between the potential employers and the suppliers of educational personnel.

There is an urgent need for having a nucleus library containing literature, pamphlets and other information about courses, careers and employment opportunities that are available. It should be the responsibility of the trained counsellor in a particular locality and the school guidance teacher in association with the employment agencies to make the students aware of this literature and information. The Robbins Committee Report on Higher Education in the U.K., referring to the difficulties created by competition for selective admissions, mentions that some of the troubles arise from lack of information. The Report observes: "Too many young people and their parents are choosing institutions and courses on the basis of inadequate knowledge. . . . We recommend that the institutions of higher education and the schools should consider. . . . how better information can be made more generally available about the great variety of courses offered in the three

main sectors of higher education." The same procedure should also be followed in respect of the availability of literature on careers and employment opportunities.

Can India with its present economic condition, afford to spend on guidance services ? How much can it afford to spend ? What should be the priority attached to guidance services ? These are vital questions for administrators as well as guidance personnel. To a certain extent, the amount of money a country is willing to spend depends upon its perception of the importance of the need. It is also a question of weighing and balancing the importance of needs and assigning them an order of priority. It must be admitted that establishing an order of priority among various economic, educational and social needs is a difficult business. In assigning priorities, financiers are usually guided by the consideration whether an item is productive or non-productive. Some people unfortunately regard guidance as a 'non-productive item' in the narrow and strict sense of the term. This is not a correct view. Guidance is productive in the sense that it contributes to the development of human resources. If development of mineral and other natural resources is considered as a 'productive' item, there is no reason why development of human resources should not also be considered as a 'productive' item. Moreover, guidance can contribute to our national economy by reducing the terrific wastage of our limited educational facilities which is occurring today, by reducing labour turnover and raising standards of efficiency and hence of productivity, and by reducing the existing as also potential imbalance in the demand and supply of man-power. It can also contribute significantly to welfare by reducing the rate of mental ill-health with all its costs and human tragedy.

The Problem of the Educated Unemployed

The problem of the educated unemployed is a phenomenon that is found in some measure or other in most of the developing countries. It has been in existence in India for a number of years and threatens to continue to do so. An estimate places it 150,000 persons in 1963. In addition to this backlog of what may be called employment seekers, it is expected that from 1964 to the end of the Fourth Plan period there would be an addition of 1.5 million new graduates who would also be wanting employment. Thus the total number of graduates for whom employment will have to be found during seven to eight years would be of the order of 1.7 in India.

In order to deal with this problem, it may be useful to get some idea of the pattern of graduate out-turn, and the experience we have had so far in respect of their employment. From an all-India sample survey conducted in 1960 by the Directorate General of Employment, it appears that nearly forty per cent are graduates in arts, 17.5 per cent in science, 8.2 per cent in commerce, and 7.2 per cent in law, while the rest are post-graduates in these subjects or graduates in professional subjects. About thirty per cent of all graduates came from families whose monthly income was below Rs. 200, while 45 per cent came from families which had eight members and above. About 70 per cent of the graduates depended upon their parents and other relations for financing their education, while thirty per cent financed their education with part-time work of one kind or another. More than sixty per cent of the graduates had reached the age of 20 and above at the time of obtaining their first degrees. Forty-five per cent of the graduates obtained a third class in their final examination, and the earnings of fifty per cent of the 1954 graduate sample who found employment in 1960 was below Rs. 200 a month. It was also found that the highest incidence of unemployment was amongst the graduates in

arts. The incidence of unemployment was also the highest as is to be expected amongst those who got a third class in their examinations. What seems to be clear from these facts is that a large number of those who pass out of our universities do not have the necessary facilities, financial and otherwise, for improving their academic equipment. It is also clear that the incidence of unemployment and more especially of low earnings, bears heavily on those who go in for a general type of university education, which is unrelated to economic activity. The inference is also clear that both vocational guidance and re-orientation of educational syllabi are necessary for the purpose of establishing a more deliberate and meaningful link between university education and employment opportunities.

Do University Employment Information and Guidance Bureaus have a role in dealing with the problem of graduate employment? Employment Bureaus are now functioning in twenty universities in India and the number is expected to reach 33 by the end of the Third Plan period. These university Bureaus can function effectively only if all graduates register themselves in these Bureaus and if all available employment opportunities are made known to these Bureaus in time and in sufficient detail by job-requirements. It is also important that employers of university graduates treat those University Employment Bureaus as the natural source to which they would turn for recruiting the graduates whom they want. From this point of view, the progress which these Bureaus have made cannot be considered to be satisfactory. The number registered is a small proportion of the total number of graduates passing out of these universities, while the position is even more unsatisfactory in regard to the number placed in employment by these bureaus. Government agencies have a particular responsibility in this matter, in view of the fact that nearly 64 per cent of graduate employment, as revealed by the all-India survey, seems to be in the public sector.

The problem before us as how to make these University Employment Bureaus the most effective instrument for securing employment for university graduates. One way is to improve their employability by helping universities to establish a better relationship between the education they offer, and the job requirements

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of the employment that is available. This they can do by undertaking a continuing analysis of the employment market for various types of university graduates; and make this information available to the universities. These Employment Bureaus should not therefore regard their functions merely as obtaining placements for the graduates who register themselves with them. They have the additional responsibility for obtaining all available material on the graduate employment market and, by suitable analysis of the same, enable the universities to go in for an effective system of vocational guidance.

As regards the immediate and major task of the University Employment Bureaus, namely, the increase in coverage both of registration and placement of their graduates, it is possible to make some specific suggestions. As regards coverage in terms of registration, there should be some mechanism by which a graduate passing out of a university is automatically registered at the University Employment Bureau. This can be done if at the time of graduation or supplication for the conferment of degree, the graduate is also required to fill up a form which would automatically place him on the register of the University Employment Bureau for a minimum period of one year after which the retention of his name in the register would require a special application from the graduate concerned. In order to ensure that statistics of unemployment do not get inflated by the failure of the graduates who secure employment either through the Bureau or on their own to intimate the same to the Bureau authorities concerned, it is necessary that every graduate who gets employment for the first time should send to the Bureau a completed *pro forma* indicating the fact of having got the employment. This will not be done if it is simply left to the will of the graduate in question. Nor will the employers on their own intimate to the Employment Bureau facts about the new recruitments they may make of university graduates. It may, therefore, become necessary to require that a graduate who is selected for employment, should produce to his employer, before he draws his first month's salary, a completed *pro forma* indicating the university from which he graduated and other details which could then be endorsed and sent to the University Bureau concerned by the employer. There is no other way by which a complete and

integrated analysis can be made of the graduate employment market; and without such an analysis it would be difficult to solve the problem of graduate employment in a satisfactory manner. In view of the fact that more than half the new graduates are employed by Government agencies of one kind or another, it should not be impossible to implement this suggestion.

As regards improving efficiency in placement, it is not only necessary that the University Employment Bureaus should have adequate and timely information about vacancies, but it would also be useful if some preparatory work is put in by the universities concerned when they recommend their graduates for employment. How exactly this is to be done and what tutorial, examination and character rolls should be maintained are all matters on which a great deal of thinking has to be done before action can be undertaken. But it is evident that an employer would be far more willing to accept a candidate coming to him from a University Employment Bureau if he feels that there has been some preliminary screening by the university authorities before the name is transmitted to him, and if further, along with the transmission of the name, information is supplied to him on certain questions which he may have in mind in considering the candidates' suitability for employment. This is a matter on which it would be useful to get into the discussion the organisations of employers both from the public and the private sectors, including the Public Service Commissions, for they, after all, are the consumers and it is important for the producers to know what the consumers want in order that they may be in a better position to satisfy their requirements. The University Employment Bureaus should therefore have advisory committees of employers and these committees should not only exist in names, but should also actively function for establishing communication between the universities and those who employ the products of the universities.

The final suggestion is that these problems of employment market analysis, vocational guidance, knowledge of vacancies and efficiency of placement are all matters that cannot be dealt with in isolation by one University Employment Bureau or another. If these are to be tackled successfully, there must be established some all-India organisation which would bring all these University

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Employment Bureaus together for the purpose not only of exchange of information and experience but also of research and guidance. It may be useful therefore to set up a new Directorate for graduate employment in the Union Ministry of Labour and Employment through the Directorate General of Employment and training. Such a Directorate could have continuous and intimate connection with the different University Employment Bureaus and also have advice at a national level, of employers, educationists and others concerned, on the subject of establishing the required degree of liaison between University education and graduate employment on a continuing basis.

The problem of graduate employment is a crucial one not only in the context of economic development but also of the political and social stability of all the developing economies. Its right solution lies in treating it as a problem in man-power planning and establishing the right relationship between university education on the one hand and economic development on the other. The university employment bureau has a role to play in this connection.

PART III

*Education
and
Development*

Education and Economic Development

The relationship between education and economic development is not a new discovery. The classical economists knew all about it, beginning from Adam Smith and ending with Alfred Marshall. Marshall, who is regarded as the doyen of all classical economists was most articulate in regard to the relation of education to economic growth. He was very much concerned with the presence in the working class of large elements of unskilled workers whose earnings were low, whose conditions of work were harsh, and whose cultural and educational equipment was poor. In such a society, the many laboured while the few enjoyed. He therefore called for a big expenditure on education and scoffed at those who would deny the funds required for financing such a vast programme of education. He repeatedly emphasised the role of skills in increasing production and specifically identified education not only as a target but also as an instrument of economic development. But somehow the relationship between education and economic development, though fully described in Marshall's works, did not catch the attention either of economists or of educationists. It is only during the last fifteen years or so in the post-war period, when economic historians and economic statisticians had started dealing with the subject of economic growth, that education has come into its own as both a condition and a stimulant for economic development.

One of the major concerns of these economists has been to analyse the factors that contribute to the growth of the national economy and to an increase in the national income. While it was realised that a rise in the national income depended largely on investment, it was also discovered that investment alone did not explain the whole of the process of economic growth. In fact, investment in terms of physical inputs like coal, steel, power, appliances and raw materials not only did not explain the whole process of econo-

mic growth, but also could not wholly account for the rate of economic growth. There appeared to be another factor besides capital and this was described as the *residual factor*, a factor which in fact contributed more than 50 per cent to the quantum of growth and which had to be identified, described, explained and analysed. This residual factor, of course, consists of several components, some of them not visible. Among the components that constitute this residual factor, education was given a big place. The other components included science, technology, organisation, research, innovation and certain qualities of enterprise and risk-taking.

It is therefore that expenditure on education came to be regarded as investment, and as *productive* expenditure, expenditure that pays for itself and leads to acceleration of economic growth. Education thus staked its claim as a principal factor in economic development and in economic growth. And yet, even today, many educationists hold that they are not concerned with the economic or employment aspects of education. Education, according to them, is for the sake of education and it is not their business to relate it to the needs of the country. These educationists would hold the State or society responsible for employment and would confine their role to giving what they called *good* education irrespective of its relation to employment or economic development. In view of this hesitation in some quarters to regard education as a major investment of economic development, it would be worthwhile undertaking a brief analysis of this question.

How is education related to economic development? Education is not just a functional concept nor is it merely an instrument of economic development. One must not create the impression that all education is linked with economic development or that all of it is necessary or essential for economic development. It is important to realise right from the start that education has a dual aspect. While education is necessary for the promotion of economic development, education is also essential for enjoying the fruits of life. One needs to be educated in order to be a better man, to have a richer life, and to have a more integrated personality. We must never ignore what one could call the "self-discovering" and the "self-fulfilling" aspect of education, the aspect

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that relates to its enrichment of human personality. With this preliminary caution, we can now discuss the relationship between education and economic development, and some of the consequences that follow from considering education as an investment.

How did economic development become possible in countries like U.K., U.S.A., Canada, Switzerland, Japan and Germany ? It became possible by the use of machinery, power, technology, science, and knowledge. These were the hallmark of the industrial revolution : machine, power, technical skills, and the development of a feeling of self-reliance *vis-a-vis* Nature. Prior to the industrial revolution, man was too much dependent on God. Gods are good, but when gods make men helpless, powerless, and fatalistic, sap their energy, take away their sense of responsibility and destroy their initiative, there can be no economic development. Economic development needs creating a new climate, a climate of confidence, a climate of understanding Nature and natural phenomena, and the ability to deal with natural phenomena. Superstition, fatalism, lack of confidence, and fear of Nature formed part of the pre-industrial revolution psychology, and obviously, they also form part of pre-developmental psychology.

To ensure economic development, it is important that the population as a whole should have a minimum standard of education, which not only means literacy but also education. Literacy by itself has no meaning, unless it is used, and used rightly. We have 100 million literates in this country but their utilisation of literacy is poor. The population as a whole should have a minimum level of education, which must involve some understanding of science and technology and the relevance of logic. The essential condition for economic development is the creation of mass literacy and mass education in the essentials and fundamentals of science, technology, and logic.

This part of education is one to which not enough attention is paid in the developing economies. In advanced countries which have had the benefit of an earlier start in matters of economic development, it was possible to secure complete literacy in the course of 40 to 50 years by way of compulsory primary education. The position is different in the developing economies. We are trying to bring about economic development much faster. What

the Americans and Englishmen, the Germans or the Japanese took 100 years to achieve, we want to do in a period of 20 or 30 years. Therefore, we cannot wait till the population reaches a stage of universal literacy by a process of the children growing into literate and educated adults. Unfortunately, adult education programmes have not received priority in our educational policy. This is one of the reasons for the failure of many of the development schemes in India, as for example, those aimed at increasing agricultural production. It is also responsible for the failure of our cooperative organisations, and for the comparative passivity, if not negligence, of our self-government institutions like *panchayats*. A large number of adult workers who are working in the economy are not literate and educated. The country aims at progressive farming; we want to demonstrate improved farming and we want our agriculturalists to understand and appreciate the need for new agricultural practices. To be able to appreciate all this, the farmer must be in a position to read. Written communication is always more effective than oral communication. In every country in the world, extension work means production of a vast amount of literature. In India, it largely means the production of village level workers and extension officers. The more important thing is to produce simple, understandable literature, literature relating to farming and agriculture, which can be used, discussed and absorbed by the farming population. Merely putting fertilisers and other aids in the hands of the farmer is not enough. These people may have traditional knowledge of farming, but the extent to which they can follow new techniques and advance by copying other's knowledge is limited. If we want advanced knowledge to contribute to a more rapid rate of economic development, we must ensure that every worker in the economy is in a position to read and understand. Education at the adult level is absolutely essential from the point of view of economic development.

It is not right, however, to let a child grow into an illiterate adult and then seek to rectify the situation by a programme of adult education. The Indian Constitution provides for compulsory education for the age group 6 to 14. This is not merely because it is a decent thing for everybody to be literate and literacy is a value

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in itself. In addition there is an economic reason, a developmental reason for primary education, for it enables children to acquire literacy and to retain it in adulthood, besides cultivating in them the capacity to acquire skills and develop the right attitude to work and production.

It is important to talk not only in terms of more enrolment or more primary schools but also in terms of the *content* of primary education. Primary education should provide the younger generation with that knowledge which will enable them to explain many things that they see, for which quite often irrational mythological explanations are given. The weight of superstition is the greatest obstacle in the process of economic development. The development of scientific attitude, an understanding of the role of technology, and a love for working with tools and implements should be the essential content of primary education, besides of course the usual training in the three R's. In addition, primary education should develop a spirit of rationality, identity, a spirit of human solidarity and a feeling of identification with the masses. Swami Vivekananda called this 'the development of heart'. Education does not only affect the head, it must also affect the heart. An educated man, whose heart is not developed, is not really educated. And this development of the heart should start at the primary stage itself.

At the end of the secondary stage, a large number of young men and women will start looking for an entry into economic activity, whether by wage-employment or self-employment, rather than go in for further education. In other words, secondary education constitutes a terminal point for a large number of people. They may become farmers, craftsmen, industrialists, merchants, clerks, factory workers, railway workers, mechanics, and so on. If secondary education is to give its graduates some skills or even attitudes conducive to economic activity, they will be going in for, it is essential that it should have diversification. Thus terminalisation and diversification constitute two basic criteria for determining the content and techniques of teaching in secondary education. At the same time, secondary education is also a continuation stage, a port of entry into the realms of higher education. One is faced therefore with the problem of evolving a system of

secondary education which will simultaneously provide for both a terminal and a continuation stage and also contain the diversification that is relevant to both these objectives. This is a fundamental problem in our educational planning that has not yet been solved in a satisfactory manner.

There are in India multi-purpose schools with multiple 'streams' but this has not led to terminalisation. Again, there are the junior technical schools, but this system also does not result in a terminal point, as the training given in these institutions does not appear to satisfy the requirements of immediate employment. Moreover, though agriculture is the country's primary industry and forms the backbone of its economic activity, there are no institutions imparting post-elementary agricultural education except in the State of Maharashtra, which has 33 schools for the purpose with an enrolment of about 3600 pupils.* For the rest of the country, including Maharashtra, agriculture constituted one of the streams in 397 multi-purpose schools, the number of students enrolled under the stream being 40,000. Thus middle and secondary education in India has almost completely neglected agriculture. The only institutions that have been doing excellent work of a terminal and employment-oriented character are the Industrial Training Institutes; but these have been organised by the Ministry of Labour and not that of Education. At the same time, the products of secondary schools who are sent up to our universities do not seem to be adequately trained for receiving higher education, judging by the number of failures, the number that take only Pass courses and the number that get a third class in their final examinations. The secondary school pupils are trained neither for employment nor higher education. Obviously this leads to economic waste and prevents the secondary education from playing its appropriate role for the promotion of economic development. It is necessary therefore to reorient the system of secondary education in order to prevent the current large rush to the universities and at the same time give the secondary school graduates a training that gives them employability and makes

*At the post-matriculation stage, however, there were in 1961-62, 106 agricultural schools which offered a two-year course in agriculture and had an enrolment of 8558.

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them productive workers when they go out into the world. Simultaneously, there should be objective and effective methods of screening those who desire to go in for higher education and facilities to give them a training that will enhance their ability to take adequate advantage of higher education. All this is not only educationally required; it is also necessary for establishing the proper link between secondary education and economic development.

Another significant fact about education in relation to economic development in India is the huge amount of wastage that is seen at all stages of Indian education. In primary education, out of 100 pupils in the first class, only about 45 reach the fifth class. Unless a child has education for four to five years, he very soon slips back into illiteracy. Again, there is a very large percentage of failures both at the secondary and at the university stages. The wastage and stagnation that prevails in Indian education is large by any standard. It becomes almost intolerable when viewed in the light of the country's meagre resources and the many non-educational demands that have to remain unsatisfied. The amount of wastage in Indian education is something which needs identification, discussion, and analysis. If there could be an increase in the percentage of passes, that would automatically mean an increase in the return from the investment in education. Today, we have about 1.4 million students in colleges and by the time the Third Plan is completed, the number might rise to 1.7 to 1.8 millions. The increasing numbers at all levels of education make imperative the finding of a solution to this problem of wastage. Regulation of admissions, improvement in content of instruction, better teaching techniques, and more appropriate examination systems, all these are involved in any attempt to solve this problem.

Finally it is very important that quite apart from improving the quality of education in the sense of reducing the percentage of failures and increasing the proportion of first and second classes, and apart from having good curricula which will fit into the requirements of our economy, there should be certain minimum norms for producing an engineer, a doctor, a technician, or even a generalist. Unless necessary inputs are provided in terms of adequate staff, equipment and other facilities, the end product will be adulterated education and not good education.

When such large numbers of people are coming forward for education not only from urban but also rural areas, it is necessary to see that the quality of education meets certain minimum standards. This calls for a sound policy of education which relates education to economic development, avoids wastage, applies some kind of functional criteria to educational investment, links up products with requirements, and establishes the right relationship between demand and supply. If this is done, it will be possible to increase the rate of economic growth in the developing economies to a substantial extent and that too, in the not too distant future and without substantial additions to investment in material output. It is for this reason that one should welcome the new trend in educational thinking that seeks to link education with economic development.

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Education and educationists in the developing economies are making increasingly larger claims on public resources; and alongside, people in authority have started asking more questions on the return this brings to the community, particularly in the context of plan priorities and constraint of resources. Thus, in India, the State Governments, to whom the Constitution has given responsibility for education, are seeking answers to questions like what they are getting by way of productive returns from the educational expenditure they incur and in what way education is geared to development.

Educationists have also started responding to the changed atmosphere. There was a time when Vice-Chancellors of Indian Universities used to hold that to talk of education in economic terms would be to judge it by the standards of the market place, whereas education is an end in itself and is more concerned with the imparting of knowledge and the development of personality rather than the cultivation of employability. Now the position has altered. Partly, it may be because of the kind of researches which have been going on in the United States of America and elsewhere in the last four or five years on the relationship between education and development and education as investment. It is only since the last four or five years that we have had seminars, workshops, international conferences, study groups and publications on education as an investment. UNESCO and O.E.C.D. have both been playing a prominent role in this matter. The contention has been that it is an investment in human resources and therefore one must not treat it as having a second order of priority. But one cannot use the argument of education as investment merely to increase expenditure on education or to give it a higher priority in terms of developmental expenditure without recognising and accepting the implications of doing so. Therefore, the criteria that are applicable to investment in general also become relevant in the case

of education. This is broadly the background of the discussions which have taken place on education and economic development in the last few years.

Gandhiji's dictum was that education should largely be self-financing, which was how he started his whole thesis of basic education as far back as 1937. At that time, the reaction among educationists was that we cannot make education into sweated labour or convert schools into little factories, and the idea that education should have anything to do with self-financing was entirely against the spirit of education. I would still take the same view if the idea is to meet the cost of education in large part through the output created by the pupils' labour. This does not mean however that education does not have an economic aspect. When we say that education should be related to development, what we mean is that, as a result of training given in educational institutions, the pupils must acquire productive capacity, be in a position to add to the sum total of production, and in fact produce much more than they would have done in the absence of this education. The test is that what 'A' has produced without education is much less than the production in the case of 'B' with education. It is the difference between the two that should be called the productivity ascribable to education. It is not the gross product attributable to an educated person, because there is a certain amount of production or a certain amount of output that can be produced without education. The economic aspect of education comes in when we measure the effect of education in increasing man's productivity or his ability to contribute to production. This incremental contribution that he makes to production must be much more than the expenditure incurred on his education. It is possible to work out a formula and say that educational expenditure is at an optimum point from the economic point of view when there is equality between the marginal cost incurred on education and the marginal return that is available from education. Broadly speaking, the return in the sense of advantages to production ascribable to education must be substantially more than the additions to expenditure ascribable to education. At least the additions to production ascribable to education must be not less than the additions to expenditure ascribable to education. While this cannot be

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described as a formula, the idea behind it is certainly relevant to the economics of education.

The first problem is: How do we measure the increase in production which is ascribable to education? This is an extremely difficult task and all the exercises which have been made either by Prof. Schultz or by Prof. Vaizey cannot be described as satisfactory. The moment we start trying to find out what the return is by calculating the number of years of working life in terms of income that one has earned and then sum it up as the total return, and then break it down by different occupations and by different kinds of productive activities and so on, we are trying to process the material to an extent to which it does not really lend itself. Now this is the second warning I would like to give. While it is good to highlight the economic case for education, to press it too far in terms of detailed calculations of quantifiable returns in terms of different kinds of education is rather difficult for the very simple reason that the return ascribable to the human factor is not merely composed of technical skills that the human being has acquired as a result of education. Given the same conditions, given the same training, given the same facilities, we will find that one group of persons making a certain contribution to production and another group of persons making a larger or smaller contribution to production. Many factors like environment, climate, tradition, discipline, motivation, organisation, emergency, etc, come into the picture. The human being is such an extraordinary factor as far as his productive capacity is concerned. The same human being can produce twice what he is producing without any change in equipment or in his skills depending on the provocation, the motivation, the urgency and so on. Therefore, it is difficult to give too detailed an analysis—and especially in quantitative terms—as to how much would be the return on teachers' training, how much would be the return on engineering training, how much on mechanical engineering, how much on civil engineering, how much on chemical engineering, how much on pharmaceutical technology, etc. At the same time, there is no doubting the reality of the existence of this relationship. What is difficult is to spell out the details of this relationship. This is a subject on which it is necessary to have more work and more thinking.

One may take Kerala as an example. In some ways, Kerala is the most educated part of India. And yet if we merely judge in terms of the growth of the domestic product in Kerala as compared with the growth of the domestic product in other parts where education is not so well-developed, one will not be able to find the kind of relationship that has been described earlier. At the same time, one can cite examples to the contrary. Uttar Pradesh and Bihar have had a lower and less dispersed rate of growth than either Madras or Maharashtra; and it is also a fact that the former two States are educationally less advanced than the latter two States.

What then are the policy recommendations that can be made in the light of the economics of education? At that point does the expenditure on education cease to be an investment or begin to give a diminishing or nil or even negative return? In my current state of thinking, I would be inclined so to say that the return on investment is bound to be positive as long as there is no unemployment among the educated persons. One is not talking of seasonal, frictional, casual or emergency unemployment but of the quantum, duration and trends in the educated unemployed. Continuing unemployment or a secular increase in unemployment of the educated suggests that the expenditure on education is not giving a positive return. That does not mean that the expenditure on education should be cut. It probably means that we must take a closer look at the expenditure on education and find out if its content is such as to be unrelated or inadequately related to productivity. From this point of view, the Indian system of education taken as a whole is not giving as positive a return as it is expected to give. For it is a fact that in spite of the economic development attendant on fifteen years of Planning, there has been a steady increase in the incidence of unemployment among the educated population. The steady increase in the numbers of educated persons registered in the Employment Exchanges raises serious doubts about the economic advisability of the large expenditure we are incurring in India on higher education. In this connection, it is relevant to note that at a corresponding stage in economic development in Japan, the proportion of expenditure incurred on higher education was much less than in India. It is necessary therefore to establish much closer relations between higher educa-

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tion, especially in regard to B.A. and B.Sc. Pass courses and manpower requirements of our developing economy than has been the case so far. This has to be done not only in terms of numbers but even more in the productivity-creating element in the educational system in terms of both skills and attitudes.

The second criterion of the economics of education, whether the return is positive or not, would be to find out the levels of earnings of the educated people as contrasted with the people who are not educated. We will find, by and large, that the picture is quite according to the text-books. We will find that the educated people have, generally speaking, earnings much higher than those of the uneducated people, leaving out returns from property and some other factors which have got to be excluded if we are to make a correct statistical comparison. In the socio-economic survey made by the author of Greater Delhi City, it was found that the incomes of people with education up to middle standard, of those who have passed up to Matriculation, up to B.A. and up to M. A. have a distinct and positive correlation between the height of education and the height of earnings.* Thus, by and large, there is a positive correlation between earnings, and education, the degree of education, the duration of education, and the extent of training which is linked with the duration of education. If we take the average earnings of the educated and their education, we will find this absolute positive correlation between the two. Again we will find, by and large, that there is a positive correlation between professional education and training and higher earnings and between non-professional training and lower earnings. That is the reason why parents want to get admission of their wards in engineering colleges or science colleges in preference to arts. If we go to the State of Madras, we will find that there are no seats available in engineering colleges; but for arts courses, seats are vacant. It is seen therefore that parents and students have become conscious of the economics of education long before either the Planning Commission or the UNESCO or the Education Commission or any other organisation started talking about it. It is of course useful to get a systematic analysis made of the earnings accruing to persons with

* Vide the author's *Socio-Economic Survey of Greater Delhi City*, Asia Publishing House, 1966.

different kinds of professional education or training and their relationship to the duration and roughly the amount of expenditure involved. Broadly speaking, the analysis will show that the longer the duration of education the higher is the rate of earnings; and the more professional, the more technical, or the more vocational the education, the higher is the rate of earnings.

One thing more needs to be said on the general background of education as investment in the Indian context where the return on education is quite low. In the case of a large number of educated people and the income that they earn, we find that the relation between non-professional and non-production-oriented education, and the earnings accruing therefrom, is perhaps even negative. Thus, in the case of a person who is a graduate clerk and a person who is a semi-skilled labourer and who may have studied up to only the third or fourth standard, it is found that the former would be getting a lower income than the latter. This means a negative return according to my definition, as less expenditure on education gets a higher return in this case. The policy implications that arise from this is that we have got to reorganise our educational system with a view to giving it more of a productivity and work-oriented form and shape. To put it differently, it means that we have got to reorganise our educational system in such a way as to make it more productivity-oriented, not so much production-oriented but productivity-oriented.

When we say more 'productivity-oriented', this is not merely in terms of facilitating employment or getting higher wages or salaries in employment. In our country because of historical reasons, education has been linked up with the getting of jobs for which one gets wage or salary as opposed to self-earnings or earnings from self-employment. The result of that has been that our educational system has been so organised and motivated as to reduce initiative, self-reliance, and readiness to take risks but, instead to create routine workers and servants. This creates a psychology in the educated man that getting a job is the only way to earn his living and makes him forget the alternative that he can make a job for himself by his enterprise, imagination, persistence, and capacity for hard work. The prevalence of this psychology finds clear illustration when we look round the country and its

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different States. An exception to this rule, however, is found in the case of the Panjabis whose refugee population showed enterprise and ability for self-employment in their economic rehabilitation after partition.* This kind of attitude, however, is not stimulated by the educational system of the country. Whether that is due to the atmosphere or the content of education, the kind of subjects that are taught, the methods of teaching that are employed or the absence of manual skills in the educational training, all these are matters for the experts to get into and find answers for. But speaking as an economist and not as an educationist, there is no doubt that because of the wage salary-cum-job oriented education, we find less of return from our educational system than we could have got otherwise. Obviously, therefore, what is required is an alteration in the educational system with a view to producing more initiative and more self-reliance. Otherwise, with this enormous expansion of education that is taking place, we are going to be confronted with a terrible problem of unemployment in the next 10 or 15 years, including not only graduates **But** also secondary school teachers. The kind of quality that is required in own-economic activity is something quite different from the kind of quality that is required in service or in wage-oriented activity. An officer or a worker in a company or a factory is not bothered about a number of things because the responsibility for initiative, imagination, risk-taking, enterprise, etc. falls on somebody else. But if he goes in for own-economic activity, even by making an investment of only Rs. 20 by selling tea on the pavement, he has to take a risk. There is no guarantee that earnings will follow the investment. Own-economic activity also means fluctuations. To be in a position to put up with fluctuating incomes requires quite a different kind of quality which most of us do not possess because we are accustomed to get our wages or salaries on the first of each month. There is no doubt that the qualities required in a self-employment and work-oriented education are not to be found in a service-oriented educational system. These qualities are initiative, imagination, risk-taking, willingness to take on any job, and public relations or ability to put up with human beings and handle people who will

* *Greater Delhi—a Study in Urbanisation* by the author.

insult and people who will not pay enough respect. If these qualities and attitudes are to be promoted by our educational system, then a new kind of orientation needs to be given to it by way of basic education or craft education or fundamental education or tool shop practice or manual labour or by other radical alterations in the methods of teaching. In the Soviet Union, they are more and more inclined to get people to acquire some work-experience before they can join the universities. This is perhaps the sort of thing that needs to be incorporated in our educational system in order to reduce the element of job dependence it now promotes and thus lessen the risk of expanding unemployment of the educated with expanding education.

The second important question is: How do we raise the income of the educated people? This involves answering the question of how to raise the rate of return on education, because the difference between the educated and uneducated is not high enough in terms of earnings. For this purpose, of course, one has to look at the content of education and to see in what way the content can be made more productive. There are two factors: one is psychological, as to how we can make the content and management of education lead to more of an own kind of work bias rather than a service kind of work bias. The other is: how to improve the technical content of education or the skill-content of education or the vocational content of education, which will enable a person to write notes more economically than otherwise, read more within a given time than otherwise, and so on. One can talk of many aspects of this factor. For example, the tutorial system is definitely a part of modern educational techniques. The whole logic behind the tutorial system as a means for raising the productivity of educated persons is that it enables a better training of the mind, as the student meets a teacher face to face rather than from the ground to the platform. There is a difference between the student who is a listener from the student who is a questioner. There is a big difference between the student who is a participant from the student who is just a recipient. The more a student is a questioner and a participant, the more productive will be the system of education. Therefore, in order to raise the returns from education, one of the things required is more of participation on the part of students in the

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educational process. It must be added that good education is not cheap education. Whether it is the inclusion of the tutorial system or of basic education or of fundamental education or of tool shop practice or of better library and laboratory equipment, education oriented towards productivity either in self-employment or paid employment is bound to be more expensive than just literacy or academic or memory-centred education. It is difficult to understand why people who so readily recognise the superiority of modern techniques in industry or agriculture and are willing to find the larger funds that its adoption necessitates are so blind as not to see the relevance of the extension of this attitude to education, which after all is one of our major forms of investment for economic development. More expensive education may mean less of extensive education or it may mean less of material investments in industry or transport or it may mean the inclusion of education among the projects listed for foreign aid. But what it does mean is that the returns on education will be much higher, the pace of development of human resources faster, and the whole tempo of economic growth on a higher key than otherwise. The sooner it is realised that cheap education is ineffective education and that ineffective education is perhaps worse than no education, the sooner we will begin to understand the nature of education as investment.

In this connection, it is necessary to draw attention to the place of the teacher in the determination of the returns from investment in education. More than buildings, libraries, and laboratories, it is the technical competence and the human qualities of the teacher that plays the largest part in the ease with which the student acquires knowledge, builds up skills, and develops the right attitude to work and enterprise. For securing and retaining the right type of men in the teaching professions, it is essential to pay them well, give them a place of honour in society, and leave them with some freedom for academic initiative. It is also necessary to give them the opportunity to keep abreast in their profession and remain up-to-date in their knowledge. By and large, these conditions are not fulfilled in India, especially in the case of primary teachers. Secondary school teachers and college teachers also do not fare well in comparison with persons with similar qualifications in other walks of life. Everyone recognises the need for doing

something to improve their condition, but implementation is slow, hesitant, and largely inadequate. What is not realised is the economic and social loss that the country sustains by this neglect of the teaching profession, for ill-paid and uninterested teachers are also incompetent teachers, and it is not only they who suffer but also their pupils. The resulting under-development of human resources leads to a corresponding reduction in the rate of economic growth and lowers the returns on the investment in education.

There is yet another factor that can either increase or diminish the returns from education; and this is what may be called the methodology of education. The efficacy of education does not lie merely in its content. The routine-minded educationist—and he constitutes the majority—is too much concerned with curricula, syllabuses, text-books, hours of work, etc. It is not sufficiently recognised that what matters is the stimulation of the student's intellectual curiosity. If once this is done, then the students do the rest. In fact, they read more both in depth and in extension, and the knowledge they acquire becomes a part of their system. Education consists of two things. One is the quantum of knowledge that is taught through the educational system, and the other is the kind of mental and other kinds of training that is got through the educational system. The latter is infinitely more important than the former. It is not suggested that the former is not important. But the latter is more important. What is required is that a few years after they had left the university, students should still be interested in whatever subject they were studying in the university. This does not come from an examination-oriented system, where the object of education becomes passing the examination and getting the economic principle of maximum return with minimum input, highest number of marks and smallest quantum of knowledge. It is not only the pupil but the teacher also who is dominated by the examination phobia. This is not conducive to a maximisation of returns from education. The educational institutions' main job should be to stimulate curiosity in the student and make him excited, interested; in other words, mobilise his own powers to supplement what the teacher gives him. The teacher's role is essentially supplementary and his contribution is a minor component in education. The major component comes from the student

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himself. To the extent that the educational system promotes this process, it enhances the returns from education.

Finally, an important part of the investment aspect is the cost of education or educational technology. There is a tendency for each college and institution to have departments in every branch of study irrespective of the number of students taking it. Not enough attention is paid to economies in construction; and prestige rather than functional utility becomes the criterion. Thus costs go on increasing without yielding proportionate returns. We have to adopt educational techniques which would lead to reduction in cost without impairment of efficiency. This may seem a contradiction in terms but the experience the world over will indicate that this is possible. Our resources are no doubt limited but we have to meet the demand for expansion and we have to strive for quality. Hence the importance of seeking techniques that will help us to make our limited resources go longer in meeting our educational demand. Some of the techniques which could be adopted are the expansion of existing institutions to their optimum viable size, opening of part-time courses and evening institutions, provision for correspondence courses, summer institutes, etc. It is thus that we can better utilise our resources and maximise returns from investment in education.

To conclude, expenditure on education constitutes an important form of investment in economic development. Investment criteria are therefore quite relevant in determining the volume and content of education. Skills and attitudes pertinent to the promotion of economic development constitute a necessary, though not exclusive, end product of education; and not only the content but also the methodology and the technology of education have to be formulated for the achievement of this objective. Within the educational system, priority has to be assigned to its different sectors, depending upon the stage of the country's development, and its man-power and attitudinal requirements. The development of human resources is the cardinal objective of education in a developing economy. It is this which makes education an investment and it is the maximisation of returns from this investment that determines its contribution to the development of human resources and therefore to economic and social growth. Hence the impor-

tance of viewing education not merely as an end in itself and a final consumption good, but also as a means to an end and a capital good that enables the human being to get the best out of his environment. Once this is recognised, it should be possible to undertake research and systematic analysis of education as investment and therefore a major instrument of growth in a developing economy.

Adult Education and Socio-Economic Development

Adult education must have its fundamental basis in adult literacy. Any country, when it achieves independence and goes in for social and economic development must launch upon a massive programme for the liquidation of adult literacy. The Soviet Union gave the highest priority to such a programme after the Revolution and succeeded in wiping out illiteracy in their country within a period of ten years. In India, the percentage of literacy which was 17 in 1951 increased to only 24 by 1961. The extent of literacy was much lower than this national average among the rural population and even more so among women in general. How can a farmer take an intelligent view of inputs and outputs or their relation to production and profits without the knowledge that literacy can give him? Without such literacy, agricultural production programmes cannot be put through on a wide enough scale. The village level worker cannot be successful if the people with whom he comes into contact are illiterate. The people, whom we are expecting to increase production, are not in a position to learn and discuss among themselves. This can be possible only if literacy becomes part and parcel of their equipment. Similarly in regard to family planning. We have to motivate the people and without literacy it is difficult to do so. It is not merely a question of distribution of contraceptives. Extensive practice of birth control can lead to a fall in ethical social standards unless it is complemented by appropriate education of the parents. Then again, how can we bring about a cooperative society on the basis of illiterate members? Illiterate people are neither motivated nor qualified to make full use of the facilities created by economic development. Nor can a people be socially activated without literacy. Lectures and seminars do not create social consciousness. The stimulation has to be indirect. When people read of great men

and great matters and ponder over what they read, it creates a lasting impression. Therefore, whether it is a matter of agricultural production or of cooperation programmes, or of social development and economic growth, it cannot be undertaken on a massive scale on the basis of an illiterate population.

But literacy is only an instrument. Literacy is not education. For literacy to become education, there must be adequate and proper utilisation of literacy. If we examine the statistics of the so-called literate population in India, it will be found that a vast majority have had education only up to the 8th class. It may be worthwhile carrying out a couple of sample surveys among the literate population to find out what exactly is the texture of this literacy. It would be useful if one could take a few villages and then find out what precisely literacy means to the literate population and what use they are making of this literacy. Without anticipating the results of such detailed enquiries, it would be safe to say that utilisation of literacy is low in India. There are a 100 million literate people in our country. It would be rash to suggest that these figures also represent the number of educated people or persons who use their literacy for an economic or social purpose. It is therefore not just literacy but adult education that is the *sine qua non* for enabling the human factor to respond in a big way to the investments that developing countries are making in their economies.

There are three major reasons for postulating this link between adult education and economic development. First, and in a way, the basic background for economic development is knowledge and desire for better ways of living on the part of the people. Even today, 82 or more per cent of the population in India lives in villages. Now, people must get some knowledge of what is better life, even in elemental terms, in terms of clothing, shelter, education, health services, etc. Not only should there be knowledge of better ways of life but there must also be the desire for getting these better ways of life. This is the sheet-anchor of economic development. Only then will the people be prepared to put in more work, show more enterprise, imagination and daring, and take more risks, all of which constitute the background for economic growth.

The second thing which is necessary for economic development is readiness on the part of the masses to take to new ways of produc-

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tion and not be bound by traditional types and ways of production. A better way of life is not going to be obtained by charity or by gift or agitation or mere talk. In the last analysis, a better way of life can be secured only by more production and better production, and by not following the old ways of production. Therefore, it is important also to cultivate readiness to take to new methods of production and the application of science and technology. A scientific approach means, apart from rationality, inculcating confidence for trying new things. There must be the readiness to adopt new methods, try new techniques, and go in for new experiments, even though this has not been done by one's father and by one's grandfather.

The third requirement for having the necessary background for economic development and the necessary cultivation of the human factor for the purposes of economic development, specially for those who are living in the rural areas, is that they should take a commercial or economic view of one's economic activity. By and large, in our country, the bulk of the people follow economic activity not as a matter of business but as a way of life, as a method of securing subsistence, not as a business activity. The moment economic activity is treated as a business activity, then calculation comes in, estimation comes in, analysis comes in, profit and loss come in, inputs and outputs come in, accounting comes in. Everybody knows that as long as a person regards economic activity merely as a way of life, he does not achieve economic progress. This means that he must know some accounts, look on his economic activity as a business, consider what he is putting in, what he is taking out, how what he puts in can be broken down into components, which component brings more, which component brings less, etc. This whole economic view of business activity and the business view of economic activity, is an inevitable part of the background for economic development without which there will not be a proper utilisation of the human factor.

To facilitate this task of adult education, the literacy required is what may be called functional literacy. Functional literacy is literacy that is geared to the promotion of economic development. This means that it is geared to the stimulation of the will for development and the creation of the capacity for development.

If we do not have functional literacy we may create facilities but these will be utilised only by a few people. When the Jayaprakash Narayan Committee on Weaker Sections came to the conclusion that there is something wrong with Indian economic development because only a small proportion of the population in the rural areas had benefited from it, this is because of the neglect of this aspect of planning, namely, the preparation of the human factor to play an appropriate role in economic growth.

Then we have social development. If we want social development, the first thing necessary is the creation of a rational attitude. This would mean conquest of superstitions and freeing of oneself from taboos, totems, and astrology. Social development also requires that there should be an awareness of social obligation, an awareness of the fact that, being born in society, one is not free, nor can one think wholly of oneself. Quite apart from religion and philosophy, as a sheer matter of social engineering, living in society automatically involves the acceptance of certain obligations without which there can be no such thing as living in society.

Another important requirement is the development of the correct social attitude. To begin with, no society can grow to its full stature which does not have an attitude of acceptance, of the human worth of the woman, her equality with man, and her human dignity. This is an essential condition for proper social development. Apart from this attitude towards women, the other thing which is very important for social development is the correct attitude towards education and towards knowledge; this attitude towards knowledge should not merely be the kind of attitude which we are having in this country, an attitude comparable to the attitude towards God, that is, worshipful but non-practised. Similarly, the attitude towards knowledge has been one of non-practice. Social development requires that this should go. This is well illustrated by the way in which the Russian society deliberately went in for developing this correct attitude towards knowledge. Now the development of the proper attitude towards education and knowledge is, in my opinion, a very important instrument for social development.

Another aspect of the attitude necessary for social development is taking a long view rather than a short view. A society which

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takes a short view is not a society which can develop because the essence of society is that it is a continuous phenomenon. Those who constitute this society today grow and die. But the society of which they form a part has a continuity extending far beyond the lives of those who compose it at any one moment. Therefore, taking the long view rather than a short view is an extremely important desideratum for social development.

For ensuring these requirements of social development, literacy and adult education are a necessary pre-condition. And without social development, it is not possible to bring about the effective implementation of such important programmes with economic implications such as the *panchayati raj* (local self-government), the cooperative movement, and family planning.

To sum up, without education—there can be no adequate education without literacy—there can be no worthwhile social and economic development. The human factor, which is a most important instrument for the promotion of economic and social development and which simultaneously is the main beneficiary of economic and social development requires that there is education on a mass scale. This is not possible without adult literacy. Without adult education and adult literacy, it is not possible to have that range and speed of economic and social development which we require, nor is it possible to have that content, or quality or tone to our economic and social development that makes it worthwhile in terms of values and welfare. A programme of adult education and adult literacy should therefore take a front place in any programme for economic and social development.

Finally, adult education should be distinguished from all other types of education in so far as it is more functional and more closely related to economic and social development than the education given in our schools and colleges. The adult knows that his education has got to be linked up with life, environment, economic activity, social activity, development, and planning. He is more interested in acquiring knowledge which will enable him to get a better understanding of the working of his own particular occupation, increase his food production, stop insects from destroying crops, make his children behave better and get more value-

from what he is actually using. He may be an illiterate but his mind is grown up and his interests are already cultivated. We are not writing on a blank slate when we are dealing with an adult.

From the planning point of view, therefore, adult education has got to be handled by a number of Ministries, as it involves agriculture, industry, community development, health, local self-government, etc. It is not something which wholly forms a part of education as defined in the country for ministerial and departmental classification. If adult literacy is equivalent to primary schools for adults, it could be in the Ministry of Education. But if adult education is something which is complete in itself, is terminal and not a point of entry, has to be linked up with economic and social development, and is intended to create in the adult self-reliance and the capacity to expand his knowledge and use his literacy for the purpose of social and economic development, then it should have an independent organisation. It is perhaps desirable to constitute an autonomous body for adult education for social and economic development in the same way as we now have an autonomous body for university education like the University Grants Commission or as we have got a separate body for social welfare like the Central Social Welfare Board. It may be worthwhile therefore to have a Central Adult Education Board, which would be autonomous, statutory, and given the functions of liquidating illiteracy and promoting the use of literacy for social and economic development. An autonomous statutory board to whom funds are given could bring in all the departments which are concerned. It could have State Boards performing the same functions in the State sphere. Its task will be not only to do away with adult illiteracy but also to see that literacy, both existing and to be newly created, is used for the purposes of promotion of social and economic development.

In conclusion, it must be said that literacy, unless used, is worse than useless because it gives one the illusion of being able to get an entry into the house of knowledge. Retention of literacy is not enough. It is the utilisation of literacy which ought to be the most important function of adult education. Utilisation of literacy really means an enormous production programme of

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books and journals, multiplication of libraries, mobile libraries, museums and all the other various ways and means by which the literacy will be used for the purpose of social and economic development and also for cultural development.

Libraries in a Developing Society

It is not necessary for me to explain what an important place the library holds in any developing society. Formal education with its lectures and seminars fails of its major purpose when it is not accompanied by a good and up-to-date library, a competent and interested librarian, and an academic climate that results in extensive and even indiscriminating utilisation of its services. Children's libraries form one of the essential ingredients for the release of the child's intellectual curiosity and the foundation for building into the adult of tomorrow the habit of reading and thereby equipping him with the key to the ever expanding frontiers of knowledge. Public libraries are an indispensable condition for the utilisation of literacy and the intelligent participation by the people in the economic and political development of the country. In fact, libraries constitute as important a sector of education as either elementary or secondary or university or technical or adult education; and any educational planning that fails to recognise the place of libraries would be missing one of the basic tiers of the educational structure.

Our educational planning so far has not given adequate attention to libraries. As far as formal education, including training and research is concerned, libraries are considered to be part of the entire programme and it is left to the authorities concerned to decide on what place they should give either to libraries or librarians in their outlays. This has not worked too badly as far as the universities and technical and professional institutions are concerned, though even here a considerable measure of credit is due to the University Grants Commission and the special assistance they have given by way of assistance for buildings, books and upgrading of library personnel. Even then, the position is not satisfactory as far as many of the mofussil colleges are concerned. It is time that a special review was made of the library budget in the 1800 colleges that we have got in the country as also of their

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existing stock of books and journals as also of their library buildings, reading rooms, and trained personnel. This is particularly important in our country, where students are too poor to be able to buy books, especially in science and the professional subjects.

The position regarding libraries, however, is much worse in the case of secondary schools, of which we have now about 22,000 in the country. When we remember that the bulk of our educated people in India are drawn from those who have only had a high school education, the damage that this is causing to the social, political and economic development of our country assumes massive dimensions. Far too many high schools in the country have libraries which consist only of four or five shelves, there are hardly any journals except those received from foreign publicity agencies, reading rooms of the right size and facilities are conspicuous by their absence, and the same is the case with trained library personnel without whom it is not possible to extend the habit of regular and discriminating reading among the school-going population. We are making provision in the Fourth Plan for the improvement of quality in secondary education; and one of the important ways of doing this is to see that high schools have better libraries and librarians than they have now. If this is to be implemented, a separate section should be set up in the State Directorates of Public Instruction, to look after library interests in the schools under their jurisdiction. It may even be necessary to set up an agency in each State for the bulk purchase of books and journals and their organised distribution among schools. In this connection, we are hoping to introduce a phased programme in the Fourth Plan under which high schools in the country will be able to supplement their books with a collection of musical records, prints, and other objects which will give students an integrated view of our composite Indian culture, and thereby not only promote national integration, but also help them to develop the aesthetic side of their personalities. Thus, it is hoped to make a significant dent during the Fourth Plan on the lacuna that now exists in our schools in their library and other cultural and functional equipment.

Libraries also have a place in elementary schools including both primary and middle schools. These schools cater for many millions of students; and a vast majority of them are not likely, for

the time being at any rate, to have education beyond the elementary stage. It is imperative, therefore, that they too should have reading material that will strengthen their literacy and also enable them to use it later on for purposes relevant to their economic development. At the same time, it is a moot point whether we should have separate libraries for these elementary schools when simultaneously we also want public libraries for the literates and neo-literates among the adult population. It would perhaps be of advantage to attach to every elementary school—if this cannot all be done at the same time, it can be done in stages—a public library-cum-reading room which will serve both the children and the adults in the village. Where this is not possible, the school could have a small library of its own, while the needs of the adults could be catered for by a system of mobile libraries. What is really important is to see that the rural population—both the children of elementary schools and the working adults—have the facilities for reading material which will enable them to function more effectively whether as students or as persons engaged in productive activity. The concept of rural libraries does not only include books and journals, it must also include audio-visual aids, even if these are available only at periodic intervals and not on a continuous basis in every Indian village.

This leads to the whole subject of adult education and public libraries. The Fourth Plan places considerable emphasis on adult literacy and adult education programmes. In fact, we are making a provision of Rs. 710 millions for this purpose. Of this amount, a substantial sum of the order of more than Rs. 280 millions is being earmarked for public libraries, especially in the rural areas. The bulk of this is meant for district central libraries, block libraries, and village libraries, while a part is also meant for urban libraries. These libraries are not intended merely or even largely for housing books on fiction or literature; they have to play a distinctive functional role in the development of education and of skills in the rural and small town population of India. They should not only supplement the library facilities available for students in their educational institutions but also be linked up with the needs of those who are taking up correspondence courses, part-time courses and sandwich courses. They should also cater to the functional

and professional requirements of the working adults in these areas. It will be seen therefore that in the Fourth Plan, public libraries occupy an important and integral place in the educational structure of the country, especially in the implementation of its role in economic and social development. To put this into effect, we need to establish public libraries where they do not exist now; and strengthen and expand those which already exist. How massive a programme this involves can easily be seen when we realise that today only 63 per cent of the districts, 27 per cent of the blocks and five per cent of the villages, have public libraries. That the place given even to these libraries is only marginal is seen from the fact that the expenditure per capita on public libraries came to only 2.9 paise in 1963-64, inter-State variation being between 0.3 paise per capita in Uttar Pradesh and 9.3 paise per capita in West Bengal. The inadequacy of our public library system is revealed by the fact that for every one thousand persons, only 16 books are borrowed in a year. It is also a fact that even of the pitifully small number of books borrowed only a small proportion consists of books that have a functional or developmental or even an educational significance. All this is an obviously unsatisfactory situation; but it is hoped there will be a significant improvement during the Fourth Plan with the provision of Rs. 290 millions which is intended exclusively for public libraries. If to this amount is added a step-up in public contributions, whether voluntarily or by law, the situation will record a further improvement.

This leads us naturally to the subject of library cess, library legislation, and public participation in the library movement. Unless the local community gets involved not only by way of receipt, but also by way of contribution in the financing and functioning of public libraries, the movement cannot expand to the extent necessary nor to that degree of effective utilisation without which more expansion is not of much functional utility. Whether a library cess is essential or not is a question on which there are differences of opinion among professional experts. But what is important is that funds are made available, whether by way of an earmarked cess or through a specific head in the revenue budgets of the *panchayati raj* institutions being a matter of detail that can be settled according to local circumstances. But library legislation

for the establishment and orderly functioning of a net work of public libraries, is, in any case, an essential condition for the growth of the public library movement. It is a matter of great regret that in spite of the time and thought that has been devoted to this subject, there are still so many States in India which do not have legislation for public libraries. With the massive programme that the Fourth Plan contemplates for the development of public libraries and especially their extension to the rural areas it is imperative that all the States in India should forthwith go in for enactment of such legislation. The model Act prepared by the Ministry of Education and circulated to the State Governments need not be taken as a constraint on any modifications they may have in mind in the light of their own experience and local circumstances. What is required is the enactment of State legislation for the establishment, maintenance and development of public libraries, even if its clauses vary from those contained in the Model Public Libraries Bill and even if it does not provide for the levy of a special library cess.

It is hardly necessary to dilate on the importance of book production in the context of the proposed development of public libraries during the Fourth Plan. It is not enough to have either legislation or even budgetary provisions. It is equally important to have the books on which the money can be spent. This has now acquired added significance in view of the fact that Indian languages are now becoming the official languages of the State Governments; they already constitute the media of instruction in schools and are expected in due course also to become media in universities, and other institutions of higher learning. Hindi has become the official language of the Central Government with English as an additional official language. The Fourth Plan period therefore is going to see a significant development in Indian languages. The Fourth Plan includes a substantial provision for book production in Indian languages to the tune of nearly Rs. 200 millions; and it is not unlikely that this may be increased following the recent decision on the language problem. The massive programme we are including in the Fourth Plan for public libraries is therefore accompanied by a book production programme which should ensure the success of the former.

In addition to legislation, finance and book production, the programme also requires for its success the necessary trained personnel as also the administrative and coordinating organisation for supply, distribution and utilisation. The Model Bill for Public Libraries provides for such an organisation. It would be necessary to supplement it by making inspection of school and college libraries part of the functions of the proposed Directorate or sub-directorate of libraries and strengthening it suitably in terms of personnel. Arrangements will also have to be made for the training programmes needed to produce the library personnel required at the various levels. It would also be useful to give a more important place than hitherto to the elements of library science and promotion of the library habit in the normal teacher-training programmes for both elementary and secondary schools. In this training programme for library personnel, there is room not only for universities but also for professional organisations both at the national and at the State levels. Training at the State level is particularly important because of the new emphasis we are placing on Indian languages and the large share that books in Indian languages are expected to occupy in our expanded programme for public libraries.

Library development has been given a more important place in the Fourth Plan than in any or all of the previous three Plans taken together. Thus libraries have now come into their own in our educational planning. As Andre Maurois has remarked: "Nothing is more important for mankind than to bring within the reach of all these means of broadening our horizons, escaping from ourselves and making discoveries which literally transform life and make the individual a more valuable member of society. And the only way to do this is through public libraries." Libraries are not only necessary for individual growth but also for the growth of the nation. They serve the mother eager to feed and train her children properly. They serve the children in acquiring intellectual curiosity and give them the means to satisfy it. They serve the student in his education and help him to widen his acquaintances with the frontiers of knowledge and in developing his skills for the promotion of social and economic growth. They serve the farmer and the artisan to pick up and use better techniques and

more suitable materials for improving his productivity. And they serve the professional *elite* to keep abreast of the various developments in their special fields. Above all, for us in the developing societies, libraries constitute an inescapable instrument for growth and economic progress.

PART FOUR

*Higher
Education
and
Development*

The Role of the University in A Developing Society

The expansion of universities and the increase in the number of persons enrolled in colleges and other institutions of higher education is a phenomenal feature of post-independence India. The rate of growth in this respect far exceeds that of either the national income or of the population. Referring to a similar phenomenon in the United States, the famous philosopher and educationist, Whitehead, said :

This growth of universities, in number of institutions, in size, and in internal complexity of organisation, discloses some danger of destroying the very sources of their usefulness, in the absence of a wide-spread understanding of the primary functions which universities should perform in the service of a nation.

What Whitehead said of the United States is even more applicable to us in India, where the growth of universities and their pupils is faster, unemployment among university graduates is higher, governmental subsidisation of higher education is larger in proportionate terms, and where the manifold pressure on limited resources is much greater in the context of our poverty and the early stage of our economic development. It is high time therefore for us to ask and answer the question : what is the role of the university in the service of the nation? And our answer should be clear and unambiguous and it should be related to the special requirements of our country in its present stage of political, social and economic development.

There is considerable weight in the view that the highest importance should be given to the economic aspect of higher education. Long ago, Locke said in his work on Education :

'Tis matter of astonishment that men of quality and parts should suffer themselves to be so far misled by custom and implicit faith. Reason, if consulted with, would advise, that their children's time should be spent in acquiring what might be useful to them, when they come to be men, rather than that their heads should be stuffed with a deal of trash. a great part whereof they usually never do ('tis certain they never need to) think on again as long as they live; and so much of it as does stick by them they are only the worse for.

The Robbins Committee on higher education in the U.K. began its listing of the objectives essential to any properly balanced system of higher education by saying:

We begin with instruction in skills suitable to play a part in the general division of labour. We put this first, not because we regard it as the most important, but because we think that it is sometimes ignored or undervalued.... We deceive ourselves if we claim that more than a small fraction of students in institutions of higher education would be where they are if there were no significance for their future careers in what they hear and read and it is a mistake to suppose that there is anything discreditable in this.... A good general education, valuable though it may be, is frequently less than we need to solve many of our most pressing problems....

The recent statute of the U.S.S.R. Council of Ministers proceeds further and defines the specific object of the higher educational institutions as under :

(To prepare highly qualified specialists, educated on the basis of Marxism-Leninism, with knowledge of the latest achievements of science and technology at home and capable of utilising modern technology and of creating the technology of the future; to carry out research work that will contribute to solving problems related to building Communism; to produce text-books and study aids of a high standard; to train teachers and research personnel;

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to provide advanced training for specialists with higher education working in different branches of the national economy, culture, education and the health services; to disseminate scientific and political knowledge amongst the workers; to study the problems connected with the utilisation of specialists who have graduated from higher educational institutions and the improvement of the training of specialists.

The accent is thus on usefulness and dovetailing with the requirements of the economy. The graduate must be useful; and his usefulness must be relevant. His services should be in demand and should command a reasonable remuneration. Otherwise, frustration attends the graduate when he leaves the portals of the university; while the nation at large finds that it has made an unproductive or low-productive investment when it spends a valuable part of its meagre resources on higher education. How far are our universities regulating their admissions, fashioning their syllabus and curriculum, and organising their research work with a view to meeting the needs of the economy, and preparing their graduates for employment that will make use of their academic training and at the same time give them satisfaction in their work and a reasonable remuneration for performing it? Our universities are not performing this utilitarian function, at any rate not to the extent that they are expected to do, in the context of the current stage of our economic development, the need for preparing our man-power for rational and profitable utilisation, and the imperative necessity for making an optimum use of our limited physical and financial resources. They are not wholly to blame for this. Universities are not in charge of the economy nor can they be expected to find out on their own man-power needs or projections in terms of detailed categories. It is also not easy to break away from traditions established during foreign rule and at a time when numbers were few, expenditure on higher education small, and anything like a rapid economic growth was outside the pale of practical politics. But it should be possible now for the universities to take account of the economic reality around them and see what they can do to fit in with its planned improvement.

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Take for example the position regarding the faculty-wise distribution of the enrolment of our pupils. A UNESCO publication gives the following figures for India :

Humanities	51.8%
Education	2.3%
Fine Arts	0.4%
Law	2.7%
Social Sciences	7.6%
Natural Sciences	26.2%
Engineering	3.4%
Medicine	4.1%
Agriculture	1.2%

Contrast this with the position in two countries which have done well in recent years in economic growth, one by socialist and planned development, and the other by capitalist and State-aided development; or even with the country from which our universities have derived their largest inspiration :

	U.S.S.R.	Japan	U.K. (Percentage)
Humanities	negligible	15.0	30.7
Education	32.4	11.0	2.0
Fine Arts	0.8	1.6	0.2
Law	6.8	10.2	3.6
Social Sciences	6.4	34.3	5.9
Natural Sciences*		4.2	21.7
Engineering*	33.8	13.1	9.6
Medicine	8.2	6.0	15.6
Agriculture	11.5	4.4	2.1

It is not suggested that we should blindly follow the pattern set by either U.S.S.R. or by Japan. Humanities and pure sciences are certainly important and should find an adequate place in our higher education. But far more important from the functional point of view are education, agriculture, engineering and medicine. Even the U.K. pattern is better than ours in this respect. As pointed out by the chairman of the Universities Grants Commission :

It is apparent from a comparison of the figures for the United

* The figures for U.S.S.R., for engineering seem also to include that for Natural Sciences.

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Kingdom and India, and also otherwise, that what is required in our case is not so much the expansion of enrolment in pure science, as in medicine, engineering, and agriculture..

The second problem arising in the context of improvement in the functional utility of our universities is the need to have a firmer and better formulated policy in regard to admissions. Every annual report of the University Grants Commission has drawn attention to the problem of increasing numbers and their effect on the quality of the output turned out by our universities. It is this pressure of numbers that is so largely responsible for the continuing large enrolment in the humanities. It is this which is responsible for the large enrolment in Pass Courses which give but little scope for employment either with dignity or reasonable remuneration. It is again this large enrolment that accounts for such a large percentage of failures and the still larger percentage of third classes from amongst even those who manage to pass. This increasing enrolment sets in motion what may almost be described as a vicious circle in regard to the quality of higher education. More numbers are not accompanied by correspondingly more and better qualified teachers nor by appropriate additions to libraries, laboratory equipment, buildings, hostels, student homes, and other academic facilities. The result is a further deterioration in quality. We cannot afford to go on in this fashion. It is true that many students come to the university because they have no alternative vocational education or immediate employment. It is also a fact that there is a deep and understandable desire for higher knowledge among our student community. Obviously, there should be expansion of vocational and employment opportunities for those who leave the high schools or the higher secondary schools. There should also be more opportunities for non-formal education, evening colleges, correspondence courses, sandwich courses and the like which will give our young men and women the opportunity to get higher education without crowding the portals of our universities. But the universities have also to play their role and speak up in the interests of improving the quality of their output and the maintaining of their academic standards. They have to press for better regulation of their

admissions, even if it involves them in some temporary unpopularity. The University Grants Commission have repeatedly drawn attention to this problem in their annual reports and called for methods by which university education is made available only to those who are most likely to profit by it. In Socialist Russia, out of two million students who applied for admission to universities and higher institutions in 1957, seats were provided only for 420,000, entrance examinations lasting over a month being held for the selection of the best students. In Japan, only 18.4 per cent of their upper secondary school graduates were able to get admission in their universities in 1955, with entrance to the universities involving a written examination, a physical test, and recommendation from the school Principal based on the student's entire school record. In the United Kingdom, individual universities have their own separate and severe tests for admission. We in India have been relying too long on the results of post-school public examinations and minimum percentage of marks for determining our admissions; instead we should start taking action that will take us concretely in this direction.

The restriction of admission to universities should also be accompanied by concrete action for expansion of vocational and other training facilities for school graduates as also opportunities for their immediate employment. Action must also be taken for the establishment and expansion on a substantial scale of facilities for non-formal education. Above all, restriction of numbers should not deny opportunities for higher education to those who have talent. Talents are scarce; and this is an age when, quite apart from social and egalitarian considerations, hard economic needs require the discovery and identification of talented young men and women and the giving of opportunities to them for higher education irrespective of their ability to finance this education. A vast scheme of merit scholarships—these could well be loan scholarships—should be instituted simultaneously with any scheme for restriction of admissions, in order to ensure quality in the university product and utilisation by the community of the best talent it has in the young among its population.

There is, however, no intention to convert universities into mere manufactories of trained personnel and vocational and pro-

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fessional skills. The university is something more than a place for creating specialised skills or fitting into the requirements of manpower planning. Economic development itself requires that there should be an increase in general as against specialised ability. Economic development is not just a mechanistic process, where outputs follow on inputs, and all that is needed is machinery, power, and technology with investment followed by capital-formation, increase in national income, and self-sustaining economic growth. Economic development means the creation of a modern and scientific society; and this requires a certain attitude of mind, and a certain code of behaviour which implies a profound change in the human factor. A traditional society does not become an industrial society merely by increasing its skills. Superstition, taboos, and irrationality have to give way to knowledge and reason; and fear and helplessness to self-confidence and positive effort. Science in its most general form has to permeate society, and a scientific temper the normal determinant of human attitudes to problems of growth and development. It follows, therefore, that university education should be so organised that all who pass through the portals of universities obtain the modicum of knowledge and understanding that is necessary to give them comprehension of the advance of science, the conquest of Nature that it has brought about, and the possibilities that it has opened out for the abolition of mass poverty and the universalisation of economic development.)

† It is also necessary that our universities should seek to secure in their graduates an acceptance of what may broadly be termed "industrial discipline". Industrial development—and this is the essence of economic development—means a considerable change in the nature of work and involves, therefore, a fundamental change in the attitude to work and the psychology of work. University education can play a significant role in the creation of such a psychology. What the university can give all its members is an understanding of the social and economic potentialities that a modern industrial society possesses and the inevitability of the discipline that is necessary for its successful operation. It is also important that university education should include within its scope a system of extra-curricular activities that would effectively stimu-

late in its pupils the habit of working in a team, and of mutual adjustment and coordinated action that is such an important characteristic of work in an industrial society; and it is necessary that this should be done for the entire student community and not only a limited number thereof.'

' Higher education has also to satisfy the emerging political requirements of our newly formed nation, State and the democratic and socialist society that we want to establish therein. Our graduates constitute the bulk of what we may call the *elite* in our society. And it is this *elite* class that has to imbue the masses of our people with the sentiments of a common nationality, a common heritage, and a common citizenship. This they cannot do if they are themselves divided in their minds and hearts by caste, communal, religious, regional and linguistic barriers. Those in charge of our universities can do a great deal both by precept and by example in instilling in their graduates a sense of Indian identity, cultural unity, and national integration. It is not so much through syllabus and courses of study as through appropriate techniques of education, extra-curricular activities, and teacher-student relations that we can fulfil this political objective of our higher education. Similarly, it is at the university stage that we can imbue the budding *elite* class with the sentiments of respect for human dignity, acceptance of the democratic process of majority decision, conformity to the rule of law, and willingness to abide by social discipline. Here again, the techniques to be used will not be so much through books and lectures as through extra-curricular activity and the creation of the right atmosphere by the teachers, whose way of life and example have the most profound influence on shaping the attitude and behaviour of their young pupils in the universities.'

' We must not also forget the role that the community expects the universities to play in preparing the ground for the establishment of a socialist society. 'Socialism does not merely mean a massive expansion of the public sector; nor is it just an enactment of egalitarian legislation or a fiscal redistribution of incomes and property. 'Socialism means an attitude, a way of life, and a sense of identification of the well-to-do with those who are not so well-to-do. Its roots are not to be found only in philosophy and intellectual conviction; it must also have its foundations in the heart

and the emotional being of its votaries. Inviolability of individual human dignity, and enlargement of one's interest and emotional identification with all human beings constitute the basic roots of the socialist message. Swami Vivekananda said: "The first of all worship is the worship of the *virat*—of those all around us. Worship is the exact equivalent of the Sanskrit word and no other English word will do". Work is worship; and service of man is service of God. Gandhiji talked of the *daridra narayan*. And Vinobaji told his companions that "If one cannot find God in society, there is no chance of finding him in the Himalayas". Nehru talked of the common man. And the Bhubaneswar resolution of the Congress promises a reasonable minimum for all in terms of food, clothing, shelter, education and health by the end of the Fifth Plan or a little later. We have a long tradition of the emotional and spiritual foundations without which socialism would only be a dry and intellectual doctrine. It is at the university stage that we must seek to cultivate in our pupils the socialist attitude, the sense of respect and regard for the other man, the feeling of identity, and the spirit of fraternity all of which constitute the grease that will oil the otherwise bureaucratic socialist machinery of State ownership and State enterprise. And once we instil the Socialist spirit in our graduates, we can be sure that they will give the country the correct leadership and conduct themselves correctly and like true socialists, when they obtain positions of leadership in the community. Here again, it is not so much the platform in the class room or the courses of studies that will do the socialist orientation. It is the atmosphere that is created in our institutions of higher education, the kind of extra-curricular activities that we encourage, and the way in which we teachers live and function in our homes and campuses that will play a crucial role in laying the emotional and spiritual foundations that are so basic to the building up of the socialist attitude in the young men and women who pass through the portals of our universities.

The role of the university in our developing society cannot be viewed only through the spectacles of an economist or a planner. In the last analysis, what one looks for in the university is the cultivation of the human spirit, the development of the human intellect, the seeking and release of the best in our emotional being. Above

all, the university is our major instrument for helping to discover and fulfil our personalities and lead a full and integrated life as human beings. When students leave the university after graduation, they must do so as good men and women. When this happens, it will be possible to establish the good society. There can be no more all-inclusive nor loftier role for a university than to help the developing society in the direction of a good society.¹ One can certainly agree with Cardinal Newman when he says: †

- ‡ If then a practical end must be assigned to a University course, I say it is that of training good members of society. Its art is the art of social life, and its end is fitness for the world. It neither confines its views to particular professions on the one hand, nor creates heroes or inspires genius on the other. Works indeed of genius fall under no art; heroic minds come under no rule; a University is not a birthplace of poets or of immortal authors, of founders of schools, leaders of colonies, or conquerors of nations. It does not promise a generation of Aristotles or Newtons, of Napoleons or Washingtons, of Raphaels or Shakespeares, though such miracles of nature it has before now contained within its precincts. Nor is it content on the other hand with forming the critic or the experimentalist, the economist or the engineer, though such too it includes within its scope. But a University training is the great ordinary means to a great but ordinary end; it aims at raising the intellectual tone of society, at cultivating the public mind, at purifying the national taste, at supplying true principles to popular enthusiasm and fixed aims to popular aspiration, at giving enlargement and sobriety to the ideas of the age, at facilitating the exercise of political power, and refining the intercourse of private life. ‡

Social Values and their Place in University Education

† What is it that society seeks in the educated man? Knowledge, a scientific temper, the right attitude to work, an awareness of the society round about him, especially of its needs and its limitations, courtesy, compassion, discipline, and a pride that combines humility in personal behaviour with high endeavour in functional activity—these are the traits that one seeks to find in the educated men. Many factors have a role in the creation of these attributes. The educated man not only influences the society he lives in but is also influenced by it. The university and the values it imparts are, perhaps, the most important among the factors that influence the make-up of the educated men. It may be worthwhile, therefore, to look at our universities and see what role they are playing in providing their pupils with the values and the qualities of leadership that the country so badly requires for facing the challenge of the political, economic, social and cultural revolution that has started in contemporary India.

The post-independence and post-planning period has seen a large increase in the number of our universities, the number of colleges that constitute or are affiliated to these universities, and the number of pupils that are attending their courses. Quantity has certainly increased but one is not sure about the nature of the change that has taken place in quality. There are complaints about falling academic standards about which it is possible to hold differing views. There can be no difference of opinion, however, about the deterioration in student discipline, and the growing indifference of the student community towards knowledge for its own sake. Reading habits are declining and intellectual curiosity is on the wane. Traditional values are at a discount, irrespective of their relevance to modern Indian problems; and

Indian culture is giving way before a polyglot caricature of western culture. Competition is taking the place of cooperation, and the economic motive is getting ascendant. The rat-race, so familiar to an industrial civilisation, is on in our own country. Social awareness and social passion are getting to be a curiosity rather than a familiar phenomenon; and the gulf that separates the class from the mass is widening not only in terms of economic condition and opportunities, but also in terms of comprehension, understanding and communication. Unless one holds on to the right values and lets them guide personal conduct, all the progress we are making with our planned economy may prove to have been in vain and the good society we seek may well elude our quest. But there is no need to give way to despair. It should be possible for our universities still to redeem the situation, on the condition that inculcation of the right values, both by precept and by example, again becomes a dominant part of university communion and conversation.

What are these right values? To begin with, we have to nurse our infant democracy and let it strike deep and strong roots in the Indian soil and its people. Democracy can succeed only if the educated classes, who provide leadership, develop respect for the masses, understanding of their problems, and readiness to subordinate their individual or class welfare to collective and mass welfare. Above all, it is important to ensure that issues are fairly and squarely placed before the people, that nothing is done either to confuse or mislead them, and that their positive cooperation and participation is secured in the task of government. Every university student should be given the opportunity to learn about democracy, its props and its pitfalls, and the rules of the game within which alone a democratic system can operate with success. Objective data on the actual working of Indian democracy at all its levels, local, State and national, should be available for study by the student community; and free intellectual discussion should be encouraged with spokesmen of different political parties. Students of course should not take active part in politics; but they must have an understanding of political events and programmes and be encouraged to apply logic and analysis to political questions instead of being swayed by rhetoric and passion born of prejudice. Debates,

study circles and seminars should be encouraged on political problems, but it should be the business of someone in a responsible position in the university to see that real discussion takes place, pros and cons are fairly set out in each case, and slogans and catch-words are not used to take the place of logic and argument. If students do not develop an intellectual interest in politics and an objective understanding of political events during their stay in the university, they will fail to form an intelligent public opinion when they go out. The result will be either passivity or mere attention to self-interest on the part of the educated classes, politicians will not have the guidance or deterrence of a well-informed and objective public opinion; slogans, passions and prejudices will hold sway, and faith in democracy will undergo a gradual erosion that may ultimately expose Indian democracy to the same fate as has overtaken democracy in so many other independent countries of Asia, Africa and Latin America. The universities have a definite role in the defence of democracy by the way in which they inculcate in their pupils understanding of democratic practices, appreciation of democratic values, and intelligent interest in political problems.

1 On the economic side, it is essential that the right attitude to work is encouraged and that monetary incentives are not all the time held up as the sole incentive for economic activity. 1 We need full appreciation by our student community of the dignity of labour. The relation between income and work needs to be stressed; and the feeling cultivated that unearned income or income got through speculation, profiteering or other unproductive or anti-social means, does not have either the flavour or the justification that attaches to income earned by work and performance of a legitimate function. A socialist society does not rest merely upon a framework of distributional justice; it also presupposes superior productivity. Pride in the efficient performance of one's work must be built into the psychology of the student community as also a feeling of pride in public property and watchfulness in its safety and efficiency. 1 A socialist society means a large public sector; and unless the public sector is productive and works with efficiency, the socialist society is not likely to succeed. The efficiency of the public sector rests in turn on the development of a sense of identification by its workers; and this requires an understanding of the rela-

tion between individuals and the public sector, and the building up of an appropriate psychological attitude, which could be done at the university stage more easily.¹ A socialist society also means regulation, controls, and an extensive bureaucracy; and if these are to operate without inhibiting initiative or stimulating corruption, the necessary values and the appropriate psychology have to be built into the curricular and extra-curricular activities and atmosphere that is a part of the university. Socialism as a way of life for those who belong to the upper strata of society is not easy nor does it come naturally. It requires both conviction and cultivation, both of which are more easily possible for the educated class at the university stage than later. Hence the importance of the role that a university can play in laying the psychological foundations for a socialist order by the atmosphere it creates and the values it inculcates during the formative years when students enter and pass through its portals.

¹ The educated classes have also to take into account the new social aspirations and attitudes released by the advent of independence, the establishment of political democracy and the beginnings of industrialisation and planned economic growth. The Constitution has abolished untouchability. Members of Scheduled Castes and Scheduled Tribes enjoy the same political rights as other sections of the Indian people, their representatives sit in the Central Parliament and in State Assemblies, and special financial and administrative provisions are made for their welfare. Political rights, constitutional guarantees and special financial provisions are all right as far as they go; but they do not go far enough. What these classes seek is social recognition. They want status and social acceptance. Intimate social contacts should be established between caste Hindus and the others in our universities and colleges. The educated man must show in his daily life his acceptance of the principle of social equality. The universities have to throw up bands of young men and women who make it their business to fight social distinctions, social discrimination and social inequalities. The social conscience of the individual student must be awakened when he is in the university.¹ We all talk of social work and social service societies functioning in colleges and universities. How far have these societies permeated the life of the student community?

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Do the poor and the lowly either in the villages or in the urban areas recognise in the university student their special friend who understands their difficulties, is moved by their distress, and would like to do something constructive to help them? Do we have any movement in our universities like the American Peace Corps initiated by the late President Kennedy? Is the social gap narrowing in India? Are our universities helping to create in the student mind the picture of an integrated Indian society shorn of its hierarchical distinctions and its hereditary divisions and telling him in what way he as an individual can help in getting nearer the realisation of such a society? The warning has to be given that a social revolution is on and unless the products of universities take a lead in the march towards social equality, they will be swept aside and others, who take their place, may not have had the advantage of a university education.

(The country is also undergoing a cultural revolution. The educated classes are fast losing their faith in the traditional forms of religion and with it also in the traditional values of religion. At the same time, no other religion or religious values are taking their place; nor is any attempt being made to re-mould old religious forms to suit modern requirements while retaining their mass appeal and especially the values they stand for. This is essentially true of Hinduism.) While religion is flying out of the window of the educated modern Hindu, other cults and superstitions including a naïve belief in astrology, charms, and the like are taking their place. The educated Hindu's loss of faith in his traditional religion is not even being compensated by the substitution of a robust atheism having its roots in humanitarianism and compassion. On the contrary, his superstitions are increasing and with it his fears and sense of insecurity, which his loss of faith no longer enables him to cope with.) Thanks to the abnormal and unnatural importance attached by the *elite* of India to the use of English as the medium of instruction, the university student is no longer interested in acquiring command of the language or languages which are the repository of his cultural and spiritual heritage. Nor is he able to acquire that command of the English language which will enable him to use it as an instrument for acquiring and expanding his universe of knowledge. His command of the English language:

is not good enough and he just struggles to acquire enough competence to answer his papers and pass his examination; and too often he fails in the examination because of his failure to acquire enough command of the English language. The linguistic hurdle he has to cross makes him concentrate on guide books, notes, and other aids to memorising; knowledge for its own sake becomes a secondary consideration; he fails to develop a living interest in the subjects he studies in the university; and ceases to be a student once he has passed out of its portals. The major objective of university education, namely, the development of interest in and capacity for acquiring further knowledge in his subjects, eludes his grasp; and all too soon after his graduation, and in far too many cases, university education gets to be only an interlude and he lapses back into the category of the less educated, the knowledge he acquired during his college days getting dimmer with time as he fails to keep it up-to-date by further reading. We have yet to grasp the full significance of the loss caused by the use of an alien language as the medium of instruction at the university stage. Meanwhile, what is clear is that this creates a further gap between the classes and the masses. The university graduates are losing contact with their own tradition and cultural values, nor are they acquiring the basic values and culture of those whose language they use as their medium of instruction. They do not write in English because they do not have enough command of that language; nor do they write in their own language, as their medium of instruction has not been their mother-tongue. Indian languages are therefore failing to grow into the social and scientific richness into which European languages have grown over the last hundred years or so. As a natural consequence, modern knowledge and attitudes are not spreading out among the people at large, and the country is left with a gaping cultural vacuum which its educated classes are not able to fill.

[Our nation today faces a crisis of character; and the only way in which we can meet it successfully is through man-making and character-building education. Of course, education has to serve the needs of the economy; and our universities must produce the skills and the attitudes as well the research that are necessary for meeting the needs of our planned economy and accelerating the

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rate of our economic growth. But we are not planning only for a material civilisation. We have proclaimed aloud our faith in human and spiritual values.¹ We want to create a classless and casteless society based on truth and non-violence. We want to develop a socialist order. We are proud of our national heritage and want to build on the Gandhian foundations of our independence. We want to combine the best in our national past with the best in the global present so that our future will be based, to use Acharya Vinobha Bhave's language, on science and spirituality. These are values; and values need to be expounded; they need to be taught; and they need to be integrated with our daily lives. Universities are the true repositories of values; and they alone can perform the function of expounding values and getting them integrated into the lives of those who pass through their gates. We must pay more attention to the place of values in our university education. The universities have to ask themselves what values they are integrating into the student community who form their trust and charge. All our universities have mottoes; and mostly they are drawn from our ancient writings and embody values that have come down from the ages. What are we doing for giving meaning and reality to these values in the eyes of our students? How far are we preparing our educated class to meet the challenge of the crisis in character that faces our nation today? While the nation must rightly go forward in its quest for material wealth and abolition of mass poverty, cannot we also retain our spiritual outlook and make it richer by combining with it the scientific spirit which is the contribution of modern civilisation? The masses must have bread before they can think of anything else; but the classes who have bread, and, in some cases, also butter if not jam as well, can surely think in terms of trusteeship, sacrifice, renunciation, and service, all virtues that have an honoured place in our national heritage. The educated man is distinguished for holding the right values, and it is the university which imparts education. It is, therefore, in the university that the student seeks to acquire values. Are our universities fulfilling this function today? On the answer to this question and the action we take as a follow-up of the answer will depend the prospects of the new society we are trying to build and especially the methods that will be employed, violent or non-

violent, to bring it into existence. [Our universities should rise to the challenge, cease to be either ivory towers or mere architects of materiality, and take on the task of imbuing their students with the values that will make them good men and good women and thus enable them to build up good society, beloved of the seers, sung by the poets, and, in our own life time, immortalised by the life and teachings of Mahatma Gandhi.]

Role of Colleges in University Education

It is high time that colleges get their due place on the educational map of this country and it is recognised that the university education is mostly imparted in colleges and not directly in the teaching departments of universities. In fact, even of the post-graduate students, the colleges are enrolling something like 45 per cent of the M.A. and M.Sc. students in the country. Moreover, 15 per cent of the Ph.D. students in art and science are also enrolled in colleges. It is not, therefore, correct to regard colleges merely as under-graduate institutions.

In collegiate education the most important to remember is the position of the teacher in the academic world. For example, if we look at the salary scales of college teachers, including principals and compare them with the salary scales of professors and readers and lecturers in the university teaching departments, we will find a big difference. It is difficult to understand by what academic logic a qualified person, who teaches in a college, is paid less and so much less than a person who teaches in a university. It is permissible if the differences were on the basis of qualifications, which should be the only academic principle. The moment a teacher is taken out from the college and put into a university, immediately his market value or his money valuation is doubled. This is happening everywhere. In this climate, it is difficult to keep up the morale of these teachers who constitute 80 per cent of those responsible for our higher education. It is high time that those who are responsible for university education in this country took serious note of the fact that the differentiation that exists between scales of pay, conditions of service, security of service, hours of work, facilities available for reading and research in terms of books, journals and large library equipment, and by way of going

to conferences and learned bodies, facilities for study leave and such other leave, for the two classes of teachers, who have the same qualifications and are engaged in the same task, should not be permitted to continue. Teaching undergraduates can be a very exciting and fruitful affair, and if a person is well qualified and wants to teach undergraduates, he finds himself handicapped by the lower salary, lower status, longer hours of work and less facilities for keeping up his academic well-being. In the course of the next two Five Year Plans at least the tendency towards this widening distinction between college teachers and university teachers should diminish. In the last analysis, academic standards depend on the teacher. Many good people are going away from the colleges to the university teaching departments. If this drain continues it will not be possible for us to raise the standards, or to get full value out of the enormous expenditure we are incurring on university education in this country.

The other important problem is the large number who are getting enrolled for higher education. On the basis of past trends of about ten per cent increase every year, we are going to add about a 100,000 students in the first year of the Fourth Plan—these numbers will increase during the subsequent years of the Plan. It is sometimes argued that such large admissions are necessary, because Lord Robbin's Report on Higher Education has suggested that, even in a country like England, ten per cent of the student population must go to the universities. It is forgotten that, when we start instituting comparisons, they should be made on the basis of common assumptions and common postulates. We cannot compare something taken from one place with something taken from another place without examining how far the comparability is on the basis of common assumptions. If we want to compare, we should compare the industrialised and the urbanised parts of India with the western countries. The rural population of England is about eight per cent and about four to five per cent of the people there are working in agriculture, may be even ten per cent. About 90 per cent of the English people live in urban areas. And those who follow agriculture or other rural occupations and small arts and crafts, small trade etc. constitute a small proportion of the labour force

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in the United Kingdom. In India, more than 80 per cent of the people live in rural areas and less than 20 per cent in urban areas. It is not correct therefore to consider the entire 450 million people of India and suggest that only so many per thousand in India are getting higher education and that we are behind the U.K. There are many other reasons why we are behind the U.K. and it is those which deserve the attention of our academicians. The percentage of failures in the year 1962 was, in the case of B.A., 54 per cent; B.Sc. 54 per cent, and B.Com. 52 per cent. Then, of those who pass, 70 per cent in B.A., 42.5 per cent in B.Sc. and 77 per cent in B. Com. get a third class. It is a strange kind of investment we are making in education, where half the products are rejects because they fail, and of the output that we actually produce in the case of Arts, Commerce and Science, about three-fourths are of poor quality. It is necessary to find out what functional utilisation is made of the education, on which we invest as far as this large number of college students are concerned. By and large, our emphasis in the Fourth Plan, as far as higher education is concerned, should be much more on consolidation, improvement of quality, increase of the science element in the syllabi, and a very considerable strengthening and upgrading of teaching as such, rather than merely increasing, in an indefinite and an automatic kind of way a 100,000 or more students every year, of whom 50,000 are going to fail and about 35,000 are going to get a third class. Viewed in this way, it is difficult to justify the advocacy of expenditure of public funds on an indefinite and automatic expansion of college enrolment.

The problems of improvement are so immense. Teachers have no rooms in their colleges for reading and thinking. A large number of lecturers live in such surroundings where they do not get any place where they can sit and read. They do not have libraries. If they want to meet students where will they meet them? Before tutorials and preceptorials are introduced in colleges, provision should be made for accommodation to teachers to meet students in the college. For raising teaching and learning standards, sufficient facilities should be provided for libraries and journals. Journals are the most important contributors to knowledge and maintenance of standards. It is important to find out what journals from different countries the colleges are getting

continuously and regularly and what arrangements they are making to keep them bound and available for reference in their colleges.

There is need for a thorough inquiry into the existing conditions of colleges and the conditions of college affiliation. If good education is to be given, and new colleges are to be added for catering to the needs of increasing numbers, then the conditions of affiliation regarding buildings, libraries, laboratories, conditions of service and security of service of teachers should be spelt out in detail. These conditions should also be enforced all over the country.

Unless the college teachers, specially in the honours classes, pay personal attention to the students, there can be no rise in standards. And this involves accommodation, physical accommodation—cubicles for teachers. It has been suggested that 25 per cent of the marks should be assigned to internal evaluation. This means that there should be periodic tests, possibly fortnightly tests. It is going to involve a large amount of labour. The correction work cannot be done entirely by fellows. Lecturers and professors also have to take some share. If there is no objection to pay teachers for examining examination scripts, there should also be none to payment for correction of class scripts if the tutorials and college assessment form a part of the machinery of university examinations.

The Planning Commission are anxious to involve the intellectuals in India as much as possible into the debate on the details of planning. For this purpose planning forums have been set up in colleges. Planning forums have to function in such a way that both students and teachers get involved in the subject of planning relating to economic, social, educational, scientific, and industrial development. There are 1.2 million students in colleges and universities with over 60 thousand teachers scattered all over the country, and they form our intellectual wealth. The principals of colleges should themselves take charge of the planning forums in their colleges, and whatever assistance they want could be had from the Planning Commission. It will be helpful if the U.G.C. also gives assistance in a big kind of way for planning forums.

Another problem that needs attention relates to college finances. The 'grants-in-aid' codes differ from State to State. There is a

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great deal of difference between what is 'approved' expenditure and what is 'approved' income. There are therefore differences on the way a college deficit is calculated for the purposes of Government grants. If some uniformity is introduced in these matters, it would go a long way to meet the problem of the colleges, especially if the U.G.C. scales of pay and academic expenditure are treated as approved expenditure. Collegiate education must be treated as a distinct item in educational development and given a specific financial provision so that it should be possible to pay special attention to their long-neglected requirements.

The other problem relates to matching grants for colleges. It is understood that quite a few States have already agreed to take the responsibility of giving the matching grants once the U.G.C. grants are over. This has to be done on an all India scale. The Planning Commission will support and reinforce the U.G.C. in trying to bring moral pressure on the State Governments and see that, to the best extent possible, the States are prepared to undertake the responsibility for making their matching contributions.

Finally, in view of the fact that colleges represent about 80 per cent of the university population, 50 per cent of the post-graduate population, and in view of the fact that Vice-Chancellors cannot be expected to take quite the same detailed personal participation in the colleges as they do in the teaching departments, it would be useful to have at least one college voice specifically raised in the councils of the U.G.C. If this is done, I am sure it will be of practical help in seeing that whatever discussions take place or resolutions are passed regarding academic standard, these do not just melt and get forgotten, but get repeated again and again in the places that matter, so that action follows resolution.

The Agricultural University

Agriculture is basic to our economy and constitutes the bedrock of all our Plans. Quite apart from the fact that an overwhelming majority of our people are directly dependent on agriculture for their very existence, the productivity and prosperity of our agriculture is essential both for capital formation and for industrial development. It is imperative, therefore, that we go all out in our planning to maximise agricultural productivity. An essential condition for doing this is the transformation of agriculture from a mere way of living to an economic and business enterprise. In order to do this we have not only to increase inputs, guarantee prices, and afford incentives, but also modernise the methods of cultivation and ensure the application to agriculture of the science and technology most appropriate to its varying conditions in different parts of the country. It is also important to instil in the cultivators the basic elements of business accounting so that they can look at their inputs and outputs from a commercial point of view and exercise their judgment in choosing methods most appropriate for maximising both productivity and profit. It is here that the Agricultural University has a vital role; for the quality of the education that it gives to its young agricultural graduates, the type of research that it undertakes on the practical production and marketing problems of the cultivators, and the kind of contact that it establishes with farmers at the field level and the information and knowledge that it communicates to them, it is all these that will determine its contribution for the promotion of agriculture.)

The Agricultural University is charged with three principal functions, namely, education, research, and extension. In fact, the most important end-product is extension, and, both education and research are but means for giving machinery, content, and efficiency to extension. It is this aspect which gives an agricultural

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university its special place both in the academic world and in the realm of economic planning. It is, therefore, essential that, right from the start, the University should establish a living and continuing connection with the agricultural community. It has to be constantly aware of the problems of rural areas and take steps to find solutions for the same. This means in turn that the whole approach of the University must go beyond the class-room and the laboratory. Its statutes and rules, therefore, must be such as will enable it to accept this wider responsibility with all its implications. Not only does this imply an absence of rigidity in its institution, its faculties, its academic council and its board of control, but also that both its staff and students keep close to the people whose interests they have to serve. The University, therefore, cannot just content itself with tackling technical and scientific problems of agriculture. It must also keep itself informed of the social and economic problems facing the agricultural community and be ready to lend its expertise and its informed judgment for the solution of these problems as also for sponsoring the solutions before the authorities concerned. In other words, it should truly become a Farmers' University, and farmers should learn to look at the University for both friendship and guidance in addition to knowledge and techniques for the solution of the many problems that confront them in their attempt to achieve higher productivity and play a more vital role in the general development of the State and the nation.)

The University should not be content merely with the production of agricultural graduates who will seek white-collared jobs in Government departments. Indeed far too many agricultural graduates, at the conclusion of their University education, just drift into government service and become officers of one kind or another in agriculture departments.) While doing useful work no doubt as parts of the governmental machinery for agricultural improvement, they have not been able to make much impact on the way of life and agricultural practices amongst the farming community at large, because they go to them instead of being a part of them. One reason for the setting up of agricultural universities is to break this barrier between the agricultural graduates and the farming community.) One way of doing this is to

ensure to the maximum possible extent that those who go in for agricultural education come from the agricultural community, with not only a traditional background of agriculture, but also with some experience in assisting their parents or other relatives in the art of agriculture.) This could be done by establishing contact with schools in rural areas and keeping a look-out for the farmers' sons or daughters who have the background, the interest, and the ability to take advantage of university education in agriculture and are also inclined to apply the knowledge thus acquired in the actual practice of agriculture.) One officer in the University may be specially designated for this purpose who will go round high schools functioning in rural areas, keep contact with the headmasters thereof, interview promising students, and then help to find the facilities, financial or otherwise, for their being subsequently brought into the University as students. It is not enough, however, to have students with an agricultural background. (The teaching they get from the University must involve practical acquaintance with the different aspects of agriculture, both as a technique and as an occupation.) Mere class-room studies, of however high a standard, will not give the alumni the necessary equipment to tackle the problems which they will face when they return to the rural areas either for engaging in agriculture or helping others to practise it better. The white-collared approach does not create an impression on the farmers. Our agricultural graduates should therefore possess both a sense of the dignity of labour and the knowledge of the requisite farm-skills, so that they may be in a position to demonstrate or practise, as the case may be, their ideas in the field.) This kind of ability and attitude cannot be acquired by the agricultural graduate through lectures or demonstrations. He has to do the work himself and know, by practical use, farm implements, improved agricultural practices, use of fertilisers and other inputs, agricultural accounting and marketing, and the place of agriculture in the economy. This kind of education can be given to agricultural graduates by giving them plots of land which they should, in appropriate groups, farm collectively for profit. They should not only plough the land, get acquainted with the use of fertilisers, insecticides and pesticides, learn about the problem of irrigation and drainage, and harvest

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the crops, but also learn how to market the produce, keep accounts, and show profits.) One cannot stress too strongly the importance of integrating such practical training with the academic courses given in agriculture and allied fields. (Much of our farming today is drudgery. It is only when young and fresh minds with a scientific outlook apply themselves to the practical task of farming that we shall begin to have an understanding and subsequent demonstration of the economics of time and motion that can help to free our farmers from that drudgery which is their lot in traditional agriculture.) (Ruskin once said: "It is only by labour that thought can be made healthy and only by thought that labour can be made happy; and the two cannot be separated with impunity".) The university, by an appropriate integration of the practical with the academic, should be able to turn out graduates who will bring about this fusion of thought and labour in agriculture.

The second major function, of course, is research. Research is a feature common to all universities and, indeed, in some ways, it constitutes the most challenging as also the most rewarding part of university life. But research in an agricultural university cannot merely be fundamental and long-term in character but must also be practical and have possibilities of application in the short period. For the promotion of research, both fundamental and applied, the first essential need is not merely the provision of adequate laboratory and allied facilities but, even more, the regulation of teaching loads within the levels that will enable the teaching staff to find time to conduct their research. In order to do this, it may be necessary not only to reduce the daily teaching load but also have a system by which teachers, who have the ability and show sufficient interest, can take one year out of every two or three years and do concentrated research during that period. In suitable cases, this facility could also be extended to one term out of every three terms. It is also important that emphasis in research should be on the many problems that confront the farmer from day-to-day in his agricultural journey. One of the reasons why our agriculture has not made a significant advance is that we have not been able to take science to the door of the farmer. This is not just an extension problem; as much if not even more, it is also a problem of ensuring that the science and technology we offer

to the farmer is related to his own specific and immediate problems. We aim at perfecting soil analysis but are unable to have cheap and effective soil testing kits which can be used by the farmers themselves; nor are research workers in a position to go out themselves and do the testing on the innumerable local variations of soil that have relevance in the soil analysis. We need, therefore, simple soil testing techniques which would not only enable the required multiplication of our soil testing stations but also enable the research workers therein to give answers to the farmers on the very day they bring in their samples. This kind of thing is common in the Land Grant Colleges of the United States, but we in India have not been able so far to offer facilities of a similar character. This is just one example. While we must undoubtedly have centralisation and regionalisation of agricultural research, there is also great necessity for the wide dispersal of research facilities. Only in this way can we take care of the many and indeed almost innumerable variations in soil, climate, environments, rural social conditions, agricultural practices, etc., which make so difficult the simple application of research results obtained either in the central or even regional research stations. What we need is a large number of small but widely dispersed stations with their ears to the ground; and it would then be for the more advanced research workers located in the universities like this to keep in touch with their problems, get their students to work on them, and tune in their research to their solutions.

The third and perhaps the most important of the functions is extension. Extension is a much used phrase and sometimes it seems to mean all things to all men. It is, therefore, necessary to have a clear idea of what one expects from an agricultural university in regard to extension. The main object of extension activity is not only to carry to the farmer the fruits of modern science and the results of special research carried out for his benefit but also to induce him to make use of these results by creating an appropriate psychological climate. Extension work, of course, will mainly be carried out by the members of the extension services whether in the agriculture or the community development departments; and the University as such cannot be expected to make itself responsible for this type of work. But what it can do is not

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merely to give the necessary equipment and knowledge and expertise in communication to the extension workers, but also help in creating the necessary psychological climate among the farming community such as will stimulate in them the desire to take advantage of the extension services offered to them by the appropriate Government departments. This second function is as important as the first for the University, if it is to succeed in its general function of extension. The staff and students must be acquainted with the practical difficulties that farmers face in the fields and, transmitting this information to the research workers, endeavour to find the answers that can then be taken back to the people. This involves a close and continuous contact of the University staff and students with the farmers on the field. For this purpose, there must be provision in the curriculum for field visits by students to one or more selected agricultural areas in the State and the writing of reports thereon for submission to their university as part of their practical work for purposes of the university examination. The teaching and research staff of the University must also get frequent opportunities for spending some time on the field and keep a record of their impressions and a note on the problems they come in contact with. These reports and records should form a part not only of the guide-lines they will give to the research workers but also of the teaching materials they will use when they give lectures on agricultural subjects to their students and, especially, when they illustrate their lectures by examples. It is essential that in the courses which are held on extension either as part of the general course on agriculture or as a special programme for agricultural graduates, sufficient importance is given to the communication aspect of knowledge. To ensure this, each of the major technical departments should have extension specialists working on their staff. These could be a part of the regular departmental staff but as far as their practical work is concerned, they should be under the field supervision of the Director of Extension. Successful extension work involves both sound research and effective communication. It is not easy to break through the natural conservatism of the farmer. At the same time, he is quick to respond to ideas which have been proven on the field and are demonstrably effective in increasing his income. The break-through can only

come when the extension workers have something worthwhile to offer the farmer. It is here that the key role of the University lies by providing something worthwhile through its agricultural departments and providing this in a form which is easily communicable through its extension departments. It is on the manner and extent to which this challenge is met that the record of the University will be judged by the country.

Agricultural universities can also provide short courses, seminars and workshops, which will bring active members of the farming community to the University and give them an opportunity to get acquainted with the facilities that it offers for understanding and remedying some at least of the problems which confront them in their daily life.

Apart from teaching extension work to its agricultural graduates as a normal part of their curriculum and giving special courses in extension to their students, the University could use its technical and extension staff for operating in-service training courses for different levels of State employees who are concerned with agriculture and community development. These courses should include not only employees at the headquarters and the district levels but also employees at the block and village levels. Apart from the value of the training thus imparted, the University itself will benefit from the presence on its campus and participation in its academic life of a large number of persons who may not be students in the ordinary sense of the word but who come in search of knowledge against the background of their own rich and varied experience in the field. Such in-service training programmes will function like the quality of mercy, blessing both him who gives it and him who receives it. The in-service trainees will pose before the University the agriculturalists' problems as they see them in the field, while, in turn, the trainees will come back from the University with an abiding sense of its interest and technical ability in the agricultural field. This process will by itself be of most significant value to the University in effecting its break-through in extension. The University should also endeavour to provide opportunities to field workers to take university degrees or diplomas and thereby improve their academic qualifications. The Government of India has introduced a scheme for advance training for village level workers

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who possess university entrance requirements and have completed five years' service in the field. These village level workers have acquitted themselves well in the class as compared to the normal run of students who do not have their background. It is for agricultural universities to make special arrangements for enabling experienced village level workers with the necessary entrance requirements to make their way through colleges and get university degrees and diplomas at the end.

Agricultural universities have a special role to play in the field of teaching and research in agricultural economics. An analysis of the development of agricultural economics as a discipline in India shows that till recently the main areas of study and research had been confined to the institutional aspects of the agricultural economy and certain aspects of government policy in the field of agriculture. The former areas include, credit, finance, marketing, tenancy and land systems, while the latter covers land revenue and taxation, prices, land reforms, agricultural labour and wages, etc. Since the early fifties, research has leaned heavily on field surveys carried out by national agencies as well as individual institutions. The new fields of study that have received emphasis during this period are farm management, study of economic and social change in rural areas including changes in credit, investment and economic condition of agriculturists and agricultural labourers and evaluation of agricultural programmes. All these studies have provided us with fresh data and new insight into the structure and functioning of our agricultural economy. By and large, however, such studies have served to present either an aggregative picture of the economy or academic guide-lines to agricultural policy. Unfortunately, enough work has not been done over this period to understand and find solutions to the practical problems that individual farmers face in improving their agricultural methods and practices. In fact, no serious attempt has been made to identify, let alone analyse, all the economic problems that beset farmers in each small region in their decisions on production and use of resources. The value of science and technology including agricultural economics will be judged by our cultivators not in terms of the abstract laboratory problems that they can solve or the neat econometric models they can create, but in the measure in which they can analyse and re-

solve their practical difficulties. This is the challenge that was accepted by the Land Grant Colleges in the United States and it is this which confronts our agricultural universities. As far as agricultural economists in those institutions are concerned, they should recognise their responsibility to serve the farmers in their region, and should draw up their programme of work with this as their aim.

There are a number of ways in which agricultural economists can relate their work more closely to the problems of the cultivators. For example, a total of local planning and extension that we have been talking about for the last ten years or more is village production planning. Whether as a concept or as a tool of extension or as a method of planning, it needs refining and development. But it does not seem to have attracted much attention from agricultural economists. Looking to the importance that the Planning Commission attaches to village plans as an instrument of agricultural growth, agricultural economists could devote some time to an academic analysis of the manifold aspects of this problem and its practical experimentation in the rural areas in their vicinity. Some good work has been done in the theoretical or model building aspects of farm-planning. Such work does help in the long run; but the more immediate need is to devise a method of farm-planning and define its content in such a way that it will be useful and at the same time applicable under our conditions. It would be helpful if the economists in agricultural universities devote far more time to study and work that would help evaluate the findings of different agricultural sciences from the economic angle and provide the methodological as well as substantive basis of their extension to farmers. Such studies should be geared to the solving of problems of individual farmers or groups of farmers rather than to focussing attention on general problems at the aggregative level.

Agricultural economics is a discipline which is of recent origin even in the west. Its transplantation to India has been even more recent. It is no wonder therefore that in the teaching of this discipline we still depend heavily on text-books and material imported from other countries. While systematised and fairly adequate data are available in respect of some of the institutional aspects

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of our agricultural economy, there is a large gap in the availability of teaching material and aids on agricultural production and marketing—their economics, management, efficiency, etc. The future development of the discipline of agricultural economics in our country is, in effect, conditioned by our present state of knowledge in these areas. For a country as vast as India, it is puerile to imagine that such knowledge can be built up on the basis of large-scale national surveys or studies. It is essentially the regional and local nature of our agriculture that needs to be studied in different areas, even within each State. The agricultural universities are extremely well-placed for this task. They would be further assisted in this respect, if the agro-economic centres set up by the Union Ministry of Agriculture were to be located within their campus or, at any rate, brought into close relationship with their departments of agricultural economics.

Agricultural universities have also an important role to play in the rural development in their States. It is necessary, therefore, that apart from fundamental research and teaching, their programme of work should be specially oriented towards identifying and dealing with the specific agricultural and allied problems of their region. Problems like water-management, fertiliser use, application of pesticides, seed selection and multiplication, cropping patterns, storage and agricultural practices etc., should all be looked at from the local angle and this too not in terms of the State as a whole but with reference to individual blocks and districts, and even individual villages. It is for this purpose that a close liaison is necessary between the agricultural universities, the agricultural administration, and the farming community. This contact should be comprehensive and continuous; and there should be effective inter-communication between the three parties. Agricultural development, however, is not merely a matter of research, teaching and extension. The results of physical research have to be tested and reformulated in the light of their economics, the effect they have on reducing costs, maximising outputs, improving quality, and increasing the farmer's profits, and above all, in securing for the cultivator a higher standard of living and a self-sustaining and larger rate of economic growth. Before there can be extension, there must be this economic setting of the physical research under-

taken by the agricultural scientists for agricultural improvement. Otherwise, the research remains academic; the graduate turned out by the University remains bookish and unable to command the respect of the practical farmer, and extension fails to have that dynamic effect on agricultural practices and farming techniques without which we cannot hope to achieve our agricultural targets. It is here that the agricultural economist comes into the picture. He must first of all have a clear understanding of the basic elements of agriculture both as a science and as an art, even though he may not himself be an agricultural graduate. Having got this understanding, he has to apply the tools of his science to the application of the results of the research done by his colleagues, examine the economics of inputs and returns, analyse the cost and price factors, the problems of storage, marketing and utilisation of credit, the possibilities of processing and allied industries, and the economics of mixed farming. In fact, he can take the initiative even in suggesting problems on which research could be undertaken by his more scientifically equipped colleagues, and in turn he can make his comments as an economist on the problems on which they are working and the application of the findings they come to. What is required is team work. The whole idea of establishing agricultural universities and instituting agricultural economics in their faculties and teaching and research programmes is on the assumption that the agricultural economist will not work in isolation but that there will be communication and coordination between the physical, the biological, and the social scientists in the University with the common objective of maximising agricultural output and incomes. We need in our agricultural universities cooperative studies and research involving agricultural economists, rural sociologists, agronomists, soil scientists, agricultural engineers, and other scientists connected with agriculture and applied activities. Only by cooperative and coordinated endeavour on the part of the faculties in our agricultural universities and institutions can we hope to make an impact on the massive problems of stagnation and low productivity in Indian agriculture.

Science and Technology in Higher Education

This is the scientific age and technology is the instrument which has been used for the major improvement that has been effected in the levels of living and comfort of the developed countries in the last few decades. The emergent nations of the developing world are now forced with the task of using science and technology in their own economic growth. The subject is so important and the problems involved are so complex that the United Nations Organisation convened a world conference to consider them in Geneva in 1963. Here we are concerned with one aspect of the problem, namely, the place of science and technology in higher education and its utilisation for economic development.

Science and scientific research are basic to the whole process of modernisation of the economy; and it also pre-supposes a sound foundation in mathematics. It is also important to realise that science is dynamic and the rate of obsolescence is quite high in the case of scientific knowledge. It is also essential to see that a minimum of scientific knowledge and especially a climate of scientific outlook permeates the entire community as otherwise it would not be easy to modernise the economy. And without modernisation, there is no hope of solving our massive economic problem to the satisfaction of the Indian masses.

How can the educational system, especially at its higher levels, help in the process ? It can do so by making compulsory the imparting of a certain agreed minimum of scientific knowledge to all graduates, irrespective of the academic disciplines they choose for their university education. Secondly, it can promote a greater inflow of students into science education at the expense of the vast numbers who are still flocking the faculties of humanities and social sciences. At the same time, care should be taken to see that science education is combined with a defined minimum admixture of the humanities and social sciences. Thirdly, it can step up the supply

of science teachers for both schools and colleges and also help in keeping their knowledge up-to-date by devices such as the summer science institutes referred to in an earlier chapter. Fourthly, it can promote a rise in academic standards by allowing the use of good laboratories during the summer vacations by students belonging to institutions with inferior equipment. The theory of 'peaks of excellence' should not, however, be allowed to minimise the need for general improvement. Simultaneously, therefore, attempts should be made to fill up lacunae in scientific equipment in all institutions imparting scientific knowledge so that minimum standards of laboratory work and experience are available to all students undergoing science education. Fifthly, there should be a constant search for science talent, accompanied by a system of scholarships and other incentives as also a suitable academic climate, so that the best use is made of the country's human resources for meeting its needs of scientific personnel. Sixthly, universities and colleges should give active support to associations and meetings devoted to specific science disciplines and accompany it by a liberal system of travel agents, study leave, sabbatical leave, visiting lectureships and other similar means for promoting scientific dialogue, updateness in scientific knowledge, and exchange of academic experience. Finally, every attempt should be made to promote fundamental research in the natural sciences by providing a suitable atmosphere and necessary funds. Above all, the scientist must be given a position of honour and respect in the community. In this connection, one may refer with some pardonable pride to the deep personal interest displayed by the late Prime Minister of India, Pandit Jawaharlal Nehru, in the promotion of science and the honouring of scientists. Reference should also be made to the official resolution on scientific policy published by the Government of India, which is unparalleled not only in the history of the developing countries but even in that of the developed countries.

The Indian Government have not only given encouragement to science education in the universities but have also set up a large number of national laboratories for scientific research in a number of subjects of relevance to economic development. These laboratories function under a Council of Scientific and Industrial Re-

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search of which the Prime Minister is Chairman, and funds, that can be described as ample in the context of India's constraint of resources, are made available for their working. Till recently, there were complaints that there was not enough of communication and coordination between these national laboratories and the university departments of sciences. But this has been rectified with the adoption of a new policy designed to bring them into close contact with the universities in their vicinity. Coordination is also promoted by the nomination of university professors and their academic scientists on the governing bodies and advisory committees of the national laboratories. The other complaints related to the lack of adequate contacts with the relevant industries and the comparative failure to translate the results of scientific research into industrial practice. These complaints though not fully justified, nevertheless had enough substance in them to warrant a fresh look at the working of our national laboratories. This has been done. The national laboratories are being asked to go in for more activity on preparing prototypes and pilot projects for industrial utilisation, and also given the necessary financial and other facilities for the purpose. Fresh steps are being taken for increasing the involvement of industry in their working. The recent emergencies resulting from armed conflicts with China and Pakistan, and increasing uncertainties of the free flow of foreign aid have given a new edge to this and placed import substitution in the forefront among the objectives of their activity. In addition to these national laboratories India has also a number of other national institutions undertaking research in the fields of agriculture, forestry, animal husbandry, nutrition, and statistics. Altogether, one can say that, among the developing countries, India has played a notable part in harnessing scientific research for the promotion of economic development.

In the field of technical education and technology, India has made a significant, and indeed a massive, advance since the achievement of independence. The number of engineering colleges has increased from 49 in 1950 to 134 in 1965, and that of polytechnics from 86 to 274 during the same period. The annual intake of students is now 25,800 in engineering colleges and 52,000 in polytechnics. Engineering and other technical education is imparted

not only at the undergraduate level but also at the post-graduate level, and research is actively promoted in these disciplines. The establishment in recent years of five national institutions of engineering and technology with foreign collaboration has immensely added to the quality and self-reliant character of higher education in these fields in India. The development of technical education is one of the high water-marks of achievement under India's Five Year Plans; and today these facilities are beginning to attract a large number of students from other developing countries in Asia and Africa. These institutions are not only supplying the requirements of the technical personnel needed by Indian economic development in agriculture, industry, mining, transport, and communication, but also beginning to cater for their material requirements by their research activity. Here again is a unique record for developing countries of the use of technical education and research for human resource development and the promotion of planned economic growth.

There are however some shortcomings that have come to light in the course of this unprecedented expansion. Thus it is now evident that the courses and training given in our polytechnics do not constitute an independent and terminal type of technical education but constitute a somewhat anaemic replica of the more advanced courses given in degree-training institutions. Enough account has not been taken of the need for locating the polytechnics in places which have an industrial climate and have facilities for industrial experience for their students. The result has been that engineering graduates are being employed in many industrial units in jobs which in other industrial countries are manned by diploma holders. In turn, engineering education for the degree courses does not measure up to the standards achieved in the better among the industrially developed countries. All this has resulted in a very high proportion of engineering graduates to diploma holders in the Indian educational system. Insufficient equipment and inadequacy of teaching personnel has hampered the development of technical education and quality has suffered because of the rapid expansion in quantity. While India will continue with her programme of expansion in technical education, the new accent will be on quality, consolidation, and improve-

ment of existing technical institutions. Attempts will also be made to fill up the gaps that now exist in regard to consultancy and design training. Technical institutions will undertake more collaboration with industry and other consumers of their end products, provision for apprentice training, 'cooperative education' and sandwich courses will be increased, and teaching personnel given the opportunity to add to their practical experience by being given the right to take up private practice within agreed limits. It is also necessary to involve industry more directly in technical training than has been the case so far. German industry has been a classic example of such involvement, and recently, legislation has been passed in the United Kingdom to facilitate and finance similar action on the part of British industry. India cannot afford to lag behind. Training in industry is a continuation of the training given in technical institutions and Indian industry has to recognise and be given its due place in the Indian system of technical education. More attention also requires to be paid to technological research for which industry should share responsibility with Government and not leave it more or less entirely to the latter as is the case at present. A greater degree of communication and collaboration also needs to be established between scientists and technologists working in industry and those engaged in teaching research in academic institutions. Technical education in India has now reached a sufficient degree of development to justify a fresh review, including the points made earlier; and it is hoped that the Education Commission, which is undertaking this review, will suggest concrete measures for reform and reorientation in Indian technical education.

There are one or two specific problems that arise in the field of technology in higher education that have not yet been resolved. Under the Indian system, the more advanced institutes of technology have either been converted into universities or given the status of 'institutions of national importance' with the statutory right of awarding their own degrees and diplomas. These institutions not only deal with post-graduate and research students but also impart undergraduate instruction. At the same time, the bulk of the engineering colleges are affiliated to universities which include in their jurisdiction not only arts and sciences but also other profes-

sional disciplines like medicine and agriculture. This dichotomy is leading to inevitable differences in standards of engineering education, partly in the degree of specialisation research and availability of facilities for better equipment, and partly in the extent of communication and coordination with the natural sciences, social sciences, and the humanities. Some method will have to be found for compensating the shortcomings in each type and it is hoped that concrete suggestions will be forthcoming from the Education Commission on this subject. The other problem is the new trend in the educational system of introducing academic courses in business management, industrial administration, business audit, developmental accounting, and other similar fields relevant to industrial efficiency. While this trend is a welcome one from the point of view of economic development, it is a matter for regret that these courses are being established mainly in the universities dealing with humanities and social sciences and not in the engineering colleges or in the higher institutes of technology. These subjects are not merely allied to economics or commerce as taught in universities; they are also closely linked with engineering and technical education. It is necessary therefore to confine the establishment of new units in these disciplines to the advanced institutes and universities of technology. At the same time, it would be useful to establish some contact and communication between the existing units and the advanced institutes of technology by placing members of the latter institutions on their advisory bodies of the former, establishment of visiting lectureship, and an elementary course in industrial technology for the students who are taking management courses.

In conclusion, it must be emphasised that science and technology in higher education form the most profitable field for investment in education from the point of view of human resource development for industrial growth. The only cautions to be observed are that the training given should be related to the needs of the economy and the personnel trained to the requirements of manpower planning.

Universities and Adult Education

Our universities have a more positive and much larger role to play in the field of adult education than contemplated so far, especially in the context of our developing economy and our desire for the establishment of a democratic and socialist society. In the discharge of this role, it is not only the teachers but also the students who have a part to play.

The educated have a responsibility towards those who are not; and this responsibility does not simply mean the former giving guidance to the latter but much more the enabling of the latter to give themselves their own guidance. In other words, the educated have to educate the uneducated; and the literate have to make literate the illiterate. Unless this fundamental social responsibility is recognised, accepted, and given effect to, it is difficult to visualise the liquidation of illiteracy in India or of the universal education of the adults in the things that matter for economic or political or social or cultural development.

The university's role in adult education could be classified under the following four heads :

- (1) Adult literacy and education for neo-literates;
- (2) Education for the adults having had education at various levels and desirous of proceeding further without having to attend full-time courses of instruction or join as full-time students;
- (3) Adult education for those who do not want to acquire university degrees or certificates or equivalent formal qualifications but are anxious to acquire knowledge in various fields such as science, technology, social studies, and the humanities; and
- (4) Research, training, and publications.

in the current context of our adult illiteracy, highest importance can be attached to the first category. If there is one field more than another for which we require a crash programme and a nation-wide mass campaign, it is that of the liquidation of adult illiteracy. We must see that within the Fourth Plan period, all persons, males and females, rural and urban, between the ages of 15 and 40 acquire literacy and the facilities for the utilisation of this literacy. For this purpose, we require a vast army of voluntary workers who must first be given a little preparatory training. These workers can be drawn from the eight million, now nearer ten millions, educated people we already have whose academic qualifications are matriculation and above, the 1.3 million students who are now studying in our 1800 colleges and 62 universities, and also some among the vast number of students who are now studying in the 22,000 high schools in the country. The students can use their summer vacations and impart literacy to the adults in towns or villages, as the case may be, depending upon where they spend their vacations. The educated adults can spend some of their evenings at a stretch for the same purpose. Practically every village and certainly all towns in India have at least a few students or educated adults who can be drawn into this vast corps of literacy workers. The whole campaign has to be organised on a village or *mohalla* or *chawl* or factory or office basis and sometimes even on the basis of individual households where it is not possible otherwise to get at the adults for imparting literacy. A great deal of detailed and painstaking staff work will be required as also books, teaching equipment, and funds for sundry expenses. It would be in the fitness of things if colleges and universities were to take a lead in this matter, establish adult literacy sections serviced by staff and students on a voluntary basis; and undertake a pilot campaign during the summer vacation to discover in detail the needs, problems, and difficulties in the way of the spread of literacy on this basis. With the experience gained and a careful evaluation of the same, it would be possible to work out the details of a national campaign which can then be put through during the remaining four years of the Fourth Plan period. The programme will of course have to be accompanied by the production of a vast number of books and other literature in Indian languages having

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functional utility and specially designed for neo-literates along with a nation-wide net-work of village, town, and mobile libraries for bringing the books within reach of the literates, both old and new, and thus enabling them to utilise their literacy for purposes of their all round social, economic, and cultural development.

The second category, namely, non-formal education for the adult with some education, who desires to improve his educational qualification, falls directly within the sphere of universities and their colleges. The academic technology to be used for this purpose consists of part-time courses, sandwich courses, and correspondence courses. If more of evening and night high schools could be established in the country, then, together with evening colleges and polytechnics, it should be possible to cater for the educational requirements of employed or otherwise occupied adults in all the places where such evening colleges and high schools exist or can be brought into existence. Here is a field, especially in terms of post-matric education, where the universities could take the lead. If an educational survey is conducted in different parts of the country of the felt needs for such non-formal education, the kind of education required and the localities most convenient to those who need this education, then it should be possible to draw up a phased programme for this purpose. The one caution that has to be added is the imperative need for seeing that the quality of instruction offered in these non-formal educational institutions is in no way inferior to that which is available in the full-time day colleges and university departments. It should be possible for many of us who may be engaged in non-teaching occupations but have the necessary academic qualifications and, even more, the requisite emotional interest, to do some part-time teaching in these institutions.

For those who are not able to take up such part-time courses either because of distance or non-availability, correspondence courses constitute the obvious solution. Though correspondence courses have been in existence for over fifty years in many of the developed countries and the Soviet Union has made it one of the major features of its educational system, they are comparatively new in India. To the Delhi University must go the credit of having successfully pioneered this educational technique. Now

both the Education Ministry and the Planning Commission have given it a significant place in their educational programmes for the Fourth Plan period. Correspondence courses combined with good and easily accessible libraries and well-designed personal contact programmes provide a satisfactory solution not only to the problem of non-formal but degree-oriented adult education but also to that of making education available to the many young men and women who do not get admission to institutions of formal education. The successful implementation of the programme, however, depends largely upon the interest that universities take in it and the work they do for giving it content and direction. While the correspondence courses have to be designed and operated by the universities or other specialised institutions of higher education, the personal contact programme should largely be operated by colleges and other similar institutions because of the numbers involved and the greater ease with which they can solve the problem of distance and accommodation for the vast numbers of non-metropolitan entrants to these courses.

The third category to which reference has been made earlier is adult education for those who seek knowledge but are not interested in acquiring any degree or diploma. Such seekers of knowledge are to be found not only in the metropolitan towns but also in the district and smaller towns and even in the rural areas. Courses of lectures, follow-up programmes in libraries, radio talks, audio-visual aids, all these have their place in this programme of adult education. Universities and colleges have a major role to play in this matter and indeed a beginning in this direction has already been made by several universities in India. What is required is expansion and systematisation and a much more extensive coverage in territorial terms than has been the case so far.

The fourth and last category in the role of universities in adult education is research, training, and publications. A great deal of research and evaluation work is necessary in regard to teaching and follow-up methods in adult literacy and adult education. Training has also to be imparted to those who are to function either as writers or as teachers in this field. Equally important are publications which would both interest and benefit not only the neo-literates but also educated adults who seek extension of their

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knowledge. What universities need for the purpose are departments of pedagogy, of extra-mural studies, and of part-time colleges and correspondence courses.

In conclusion, a reference may be made to the organisational implications of the role we are seeking to give to universities in adult education. Without a specific organisation charged with the responsibility for this programme in each university, and indeed in every college, and accountable for success or failure in its implementation, there can be no massive programme of adult education. A comprehensive and adequately staffed department of adult education, including different sections for literacy and neo-literates, non-formal but degree-oriented adult education, education for educated adults seeking knowledge but not formal degrees or diplomas, research, training and publication, needs to be established in every university; and it may even be necessary to place at its head a Director who will have the status of a Pro-Vice-Chancellor.



PART FIVE

*Technology
of
Education*

Correspondence Courses and Summer Science Institutes

India has conservative academic traditions. The very idea that degrees or even diplomas could be conferred without full time and collegiate instruction was considered in respectable academic circles to be beyond the pale of acceptable academic practice. This is why it took us so long in India even to go in for a pilot project in correspondence courses, when instruction by correspondence has had a history of more than 50 years in the world and included many of the advanced countries within its range. The method of supervised correspondence study is now widely used in several countries of the world such as the U.K., the U.S.A., the U.S.S.R., Scandinavia, Netherlands, West Germany, New Zealand, Ethiopia, South Africa, Indonesia, Japan, Malaysia and several countries in the Commonwealth. In the U.S.A. alone there are today 56 universities or institutions which are imparting education through correspondence to several million students every year. More persons enroll in correspondence courses every year than those who join the first year of all colleges and universities combined. The Soviet Union which has achieved a remarkable break-through in education, as in other fields, has used this method for training a very large number of engineers and scientists and teachers for her vast educational expansion programmes. Thus something like 40% of the 2.2 million students in the Soviet Union undertaking higher education are getting their instruction through correspondence courses. Even in the United Kingdom there are a large number of students undergoing non-formal education, something like 130,000 students, in science, in technology, in teacher training as well as in arts and social sciences. Other countries like Japan, Australia, Indonesia and Malaysia have also gone in for correspondence courses on a large scale.

We in India have to see that the maximum possible effort is undertaken for the expansion and for the improvement of educa-

tional facilities in the country but this has to be done within the broad frame-work of our limited resources. Obviously, it is not possible to find the money for buildings, improvement of staff-pupil ratio, and the provision of proper equipment, libraries, laboratories and so on for all the increasing number of students who flock to our universities and colleges. If we still persist in going on with additional enrolment on the vast scale we are now doing, the result is a dilution in quality and the education offered becomes an adulterated product.

On the other hand, education cannot be denied to people who want it. India is a democratic country and believes in a socialist society. The hunger for education has to be satisfied but this cannot be done through a supply of adulterated products. The way out of this dilemma is through non-formal education. Correspondence courses and all other non-formal educational techniques, which have been used in other countries, will have to be thought of in this country in order to meet this rising demand for higher education.

The cost of education, through correspondence courses, is said to be less than half the cost of regular education. Actually, this is an understatement of the position because the student who goes to a full-time college cannot earn, while a student who takes correspondence course or a part-time course can earn and learn at the same time. While teachers' salaries and other recurring expenditure are taken into account when working out the cost of education it is forgotten that the earnings foregone by the students who go in for formal education should also be reckoned. That is why in the most advanced countries, even when they could perhaps afford to have colleges for every student, there are part-time and correspondence courses for the benefit of the students who want to start earning at the age of 16 or 17 and cannot therefore afford to join a regular college. India is unable to afford the cost of formal education for all of its increasing student population. The country's academicians should therefore look upon this whole subject of informal education with more sympathy and understanding than they have done so far. In fact, some of the country's enterprising journalists could go round the world and write articles about correspondence courses and other institutions and techniques in

Correspondence Courses

the field of informal education they see even in the advanced countries, so that public opinion in India could get educated and people could get to know about its relevance to the Indian economic situation. Correspondence courses should cover not only arts subjects but also pedagogy, science, and technology. In the Soviet Union, 70% of the enrolment in correspondence courses is for teachers' training. This is also true of Japan as well as of Indonesia and Malaysia, where the teachers' training programme in the correspondence courses is being used to clear the back-log of untrained teachers. Japan has used correspondence institution for the training of several thousands of teachers who were badly needed after World War II. The Soviet Union has made large use of correspondence courses for training engineers and technicians, and so has Sweden. Science is also being taught in a number of these countries. The important thing to remember, however, is that correspondence courses must also include a certain measure of personal contact between teachers and students in the case of arts subjects, laboratory and workshop experience in the case of science and technology, and work in practice schools in the case of pedagogy. For this purpose, provision has to be made for correspondence course students to spend some time at the centres from where these are being organised for personal contact programmes, including lectures, seminars, and social get-together. Specified laboratories, and workshops should be made available during vacations for giving correspondence students opportunities to perform experiments and obtain workshop experience; all this should be done under the guidance of approved teachers who should be specially remunerated for foregoing their vacations. As regards practice schools, it would be better if arrangements could be made for weekly attendance in the very places where the correspondence course students are in residence; where this is not possible, special arrangements will have to be made for them to spend a fortnight or a month during term time in places where there are practice schools and where supervision would also be available. Moreover, it is essential that we must solve the problem of books for the correspondence course students. Spending Rs. 75,000 and keeping the books in the library of the directorate as the university of Delhi has done does not solve the

problem of correspondence course students who come from far-off places. It only solves the problems of those who reside in Delhi. We should have a massive programme to send books to the correspondence course students wherever they are. For this purpose, it will be necessary to start a network of libraries of university status all over the country, if not in every district, at least one in each of a group of 5 to 6 districts. These libraries should have a developed system of lending by post and use of mobile vans. Use of audio-visual aids could also be a useful supplement. All this will of course mean an increase in the cost of operating correspondence courses, but even then, the cost per student will be considerably less than in the case of formal education.

Finally, bridges should be built between non-formal and formal education by attaching correspondence course students to the educational institutions in their locality as associate students with the privilege of using the library, and taking part in extra-curricular activities. It would also be a good incentive to provide scholarships for post-graduate formal education to the correspondence course students who do exceptionally well in under-graduate correspondence courses. This would also provide an acid test of the efficacy of correspondence courses, as correspondence course students will sit side by side in the M.A. or M.Sc. classes with students educated through regular institutions and compete with them in daily work as well as in the final examination. Altogether, the system of correspondence courses is a valuable addition to educational technology, especially in the context of developing economies with their constraint of resources.

Another important addition to educational technology which has recently been introduced is the summer science institute, which brings together selected college and high school teachers of science in separate groups and by different subject for the purpose of a two-month refresher course in modern scientific developments and new methods of teaching in their fields. Experts in the field conduct these courses and modern literature is also supplied to the trainees. Apart from bringing modern knowledge to the many teachers whom we have in schools and colleges, these institutes will stimulate academic curiosity and rejuvenate the academic interest and the academic personality of the teaching profession

in this country. Obviously, it is not possible to bring every teacher every year to a summer institute in order that he may keep himself up-to-date. The summer institutes can only be catalytic agents. The main party has got to be the teacher and it is only in creation of this desire for more knowledge on the part of the teacher that a permanent contribution will be made by these institutes to the improvement of standards of education in our country. It is however necessary to devise ways and means for keeping alive the knowledge and attitudes stimulated by these summer institutes. Getting together these trainees after two years or three years or four years is not good enough. These gatherings will become like the great conventions, very good from the social point of view, but not having any special value from the point of view of stimulation or intellectual follow-up. Therefore, we have got to think in terms of a follow-up which is more continuous. Perhaps it may be useful to have a journal which will deal with modern science, which will be available to all teachers who come to these institutes and even those who do not come to these institutes, which would keep their interest stimulated and their curiosity aroused, and not let the things slide after they have gone away from the summer institutes. We can have a journal of modern Chemistry, modern Physics, modern Botany, modern Zoology, etc., but these will have to be printed in many thousands in order to keep up the kind of work started by the summer institutes. The second suggestion for the follow-up is that all these high schools and colleges have first class science libraries. There should be a programme for establishing a nuclei of modern science books, which will be in the library of each of these colleges and schools with of course some appropriate provision for an increase every year by 5 or 10 new books. If these two suggestions are implemented, the results achieved by the summer institutes will take root and fructify in imparting a permanent and self-sustaining capacity for upto dateness and modernity in our science teachers and their science teaching.

The Teacher and the Teaching Process

The most important factor that determines educational efficiency is the response that students make to the facilities made available to them for their education. It is almost as true today as it was in the old days of the Indian *gurukul* system of education that the teacher is the central figure in the educational system. Given the best accommodation, equipment and other facilities, if the teacher is of poor quality or indifferent to his work or is using inefficient teaching methods, the educational system is bound to be inefficient. Conversely, even with shortcomings in accommodation, equipment and other facilities, if the teacher is of good quality or is dedicated to his work or using the right teaching methods, the educational system is certain to gain in efficiency. Hence when we are discussing the technology of education which means the most economic way of maximising returns from a given educational system, the teacher and teaching methods constitute an important subject for attention.

The main responsibility for improving the professional quality of the teacher rests upon the efficiency of teacher training institutions and the research activity that is carried on in pedagogy. The immensity of the Indian problem in this connection can be gauged from the fact that the number of elementary and secondary school teachers in India has risen from 750,000 in 1950-51 to above 1,850,000 in 1965-66. It is expected that this number will be added to by another 650,000 during the Fourth Plan period. For preparing these teachers, we had 782 training schools for the elementary stage teachers and 53 training colleges for the secondary stage teachers. These numbers have risen to 1,300 and 260 in 1965-66 with annual intakes of 110,000 and 35,000 respectively. In spite of this vast increase, we have not liquidated the problem of untrained teachers. The pace of expansion in enrolment of pupils is so fast that though the percentage of untrained teachers

Teacher and Teaching Process

has fallen from 43 in 1950-51 to 28 in 1965-66, the absolute number of untrained teachers has increased from 320,000 to 600,000 during this period. In addition, the country is faced with an acute shortage of teachers in mathematics and the natural sciences and this is estimated to be of the order of about 40 per cent during the current year. The quality of teacher training also needs substantial improvement.

With a view to improving the quality of teachers in elementary schools, the following steps have been taken or are proposed to be taken in the immediate future:

- (1) raising the minimum academic qualification of teachers of primary schools to the completion of secondary education.
- (2) promotion of larger primary schools with headmasters who have graduate qualifications.
- (3) increasing the duration of the training course in all States from one to two years.
- (4) introduction of obligatory in-service training once in five years for teachers of both primary and middle schools, to be organized during long vacations in teacher training institutions.
- (5) improvement in salary scales and fixation of a national minimum of not less than Rs. 100 a month.
- (6) upgrading of qualifications of teachers in middle schools along with the requirement that one-third of the teaching staff should have graduate qualifications and some provisional training.
- (7) institution of correspondence courses for untrained teachers together with incentive payments for taking up these courses.

As regards teachers of secondary schools the following steps have been or are proposed to be taken in the immediate future:

- (1) steady increase in the number of teachers with graduate and post-graduate qualifications.
- (2) special training programmes to enable teachers with lesser qualifications to improve their qualifications to-

gether with a strict confining of new recruits to persons with graduate or post-graduate qualifications.

- (3) substantial expansion in summer science institutes, refresher courses etc. with a view to maintaining the teachers' interest in his subject and enabling him to become up-to-date in the same.
- (4) improvement in salary scales.
- (5) institution of correspondence courses for teachers who are either untrained or have inferior qualifications, together with incentive payments for undertaking these courses.

In addition to these measures directly aimed at improving the quality of the serving teacher, steps have also been taken or are proposed to be taken for improvement in the training institutions which produce these teachers. Thus, State institutes of education have been established in the different States of the Indian Union for training the teachers of the schools which train teachers of elementary schools, and undertaking research in matters relating to elementary education. Schools for training elementary teachers are to be expanded and improved in respect of buildings and equipment, curricula, and academic qualifications of the teachers working in these institutions. Special attention is to be paid to the improvement of teacher training colleges in secondary education by improvement in the status and salary scales of their staff, strengthening of their laboratories and libraries, increase in hostel accommodation and provision for in-service training, summer institutes, and advanced courses. Five regional colleges of education have been established for training the teachers of these training colleges and providing specialised training courses for teachers in mathematics and science, as also in some other subjects included in the different 'streams' of the multi-purpose schools such as agriculture, commerce, and technology. Provision has also been made for training programmes and in-service programmes for teachers in polytechnics and junior technical schools. Institutes of English have been set up and their number will be increased in order to improve the methods of teaching English and training English teachers for secondary schools.

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India is also going in for a programme of educational research. In addition to the research work that is being carried on in the State Institutes of education, the Regional Colleges of Education, and university departments of education where they exist, a National Council of Educational Research and Training has been established as an autonomous body for covering different areas of educational research, training and extension work. New departments like teacher education, educational administration, science education, and tribal education have been added in recent years. The Council is also in charge of text-book research, educational and vocational guidance, examination reform, problems of science education, and revision of curricula for secondary schools. During the Third Plan period, an expenditure of Rs. 64 millions was incurred on the National Council. A provision of Rs. 110 millions is being made for the Fourth Plan period, in addition to meeting on a continuing basis the level of current expenditure reached in 1965-66. In addition, steps are being taken for the expansion, and establishment where they do not exist, of State Bureaus of educational and vocational guidance and of evaluation units.

There is however one important lacuna in the present position regarding educational training and research in this country. Education as an academic discipline has not yet received due recognition from the universities. Nor is there adequate communication between the academic world in general and the training and teaching institutions in education. The latter are more or less dominated by Government officials and educational administrators, which is not conducive to the creation of a dynamic and creative climate so necessary for research, especially from the point of view of meeting the requirements of economic growth and social change. There is also an uneasy feeling that those with life-long experience in the actual field of secondary education do not get an adequate opportunity to play a positive role in the working of these institutions and the desired reorientation of educational policy. It is suggested therefore that universities should be actively encouraged to set up their own departments of education, thereby not only giving this development-oriented discipline its rightful academic place in the university hierarchy but also enabling it to grow richer and more productive by continuous contact and intimate association with

the best thinking in the subject disciplines. Educational methodology after all is only a tool, the substance is furnished by the subjects which are taught. And unless we bring about an intimate relationship between the best in the two, we will not get the maximum results from educational training and research. It is also necessary in this connection to provide for a more integral relationship between universities and the State institutes of education, the regional colleges of education and the National Council of Educational Research and Training. Formal relationship by the nomination of a few vice-chancellors or other non-official educational administrators on the governing bodies of these institutions is not the answer. What is required is intimacy and continuity of relationship that will make for mutual knowledge and mutual impact; and for this, more effective measures will have to be devised than the purely formal ones employed so far. More opportunities should also be provided to experienced and able teachers in secondary schools to be associated with the working of institutions of educational research and training.

In addition to the measures suggested above for improvement in the quality of the teacher and of the institutions that train him and undertake research, it is essential to effect improvement in the teaching process employed, especially at the primary and the university stages. At the primary stage, more stress must be laid on interest-oriented activity than merely on teaching the three Rs, the bugbear of examinations should not be brought in, and there should be no detentions. Teaching should be more directly related to the environment, and illustrated by examples familiar in the child's experience. Above all, teaching in primary schools should be such as to attract the child to go to school rather make him reluctant. At the secondary stage, stress should be on class work rather than on the annual examination. Deliberate attempts should be made to promote the reading habit; and extra-curricular and group activity should find a larger place in the school time-table. Provision should be made for tool shop practice, and education given a work-orientation. It is really at the collegiate and university stage that improvement is needed the most. Here the prevalent practice is to rely on the lecture method accompanied by an examination system designed more to test memory than intelli-

Teacher and Teaching Process

gence and reproducing capacity rather than logic and analysis. The student gets no sense of participation in the educational process and has but little opportunity to develop his intellectual curiosity. Almost the entire emphasis in the system is on the acquisition of knowledge, and there is but little attention given to development of the attitudes or cultivation of the qualities which are specially relevant to a developing economy and a changing society. All this results in diminishing the capacity of the educational system to draw out the best in the human factor. It is necessary therefore to undertake a fundamental revision of the teaching process at the stage of higher education if we want to get the maximum returns from our investment in higher education.

The main emphasis in a revision of the teaching process is the need for securing the student's participation. This cannot be done by relying on lectures as the practically exclusive method of instruction. A large number of lectures, dictation of notes, almost mechanical reliance on given text-books, and testing the student's response only at the time of the annual examination are educational practices that are not conducive to student participation in any positive or dynamic sense. Tutorials, preceptorials, seminars, syndicate discussions, encouragement of reading books other than merely text-books and particularly of journals, objective tests at frequent intervals followed by an annual examination intended to evaluate analysis, synthesis, logic and exposition rather than memory and quantum of knowledge, these are the techniques now being employed in higher education in a number of advanced countries; and these need to be introduced in India as well on a more extended and more effective scale than at present. It may also be worthwhile introducing a weekly or fortnightly period for questions and answers. There should also be more emphasis on written work by the students as a normal part of their education. Of all these, the tutorial system is the most suited to bring about the intellectual development of the individual student; and it should be introduced at least in the case of honours courses and certainly in regard to post-graduate instruction. Research work for the Ph.D. degree needs to be preceded by a preliminary training in research methodology and supplemented by general courses of an advanced character in the field pertaining to the specific subject of research

study. Marking examination scripts should be in terms of classes and sub-classes rather than in arithmetical numbers which sometimes even include fractions. In the case of honours and post-graduate examinations, *viva voce* by the examiners who have corrected the written scripts would restore some balance to the judgements reached as a result of the examination. Though all these are familiar ideas, it is surprising how few of them find inclusion in actual practice in the technology of higher education in this country.

In conclusion, it must be emphasised that teachers and the teaching process can make considerable difference to the actual productivity of the educational system. Apart from the measures to which reference has been made earlier, it is also necessary to keep both these subjects under continuous review and research. Only by this way can we hope to keep our educational system up-to-date in its working and ensure maximisation of returns in terms of human resource development from the increasingly massive investment we are making in education.

The Parent's Role in the Educational System

There are four groups of persons who together determine the quality and the efficient functioning of the educational system, namely the teachers, the educational administrators, the Government, and the parents. Parents, however, often do not realise that they too have a positive role in the educational process. They function as if they are just purchasers of education for their children and tend to ignore the fact that they are part producers as well.

It is, however, essentially at the elementary education level that the parent's role is particularly important. The most impressionable age is during childhood and much of the response that a child makes to the educational system depends upon the home atmosphere, the way in which the parents conduct themselves in their daily life and the kind of interest they take in their children's education. To the child the parents and the teachers form the two most vital influences, while the school and the home constitute the two most important media for the gathering of experience. When there is a contradiction between the two, as is often the case in both developed and developing economies, the child gets bewildered, develops a sense of insecurity and a feeling of unsureness, and is not able therefore to develop either his talents or his character to the best of his ability. The best way to resolve such a contradiction and make the school and the home function as complementary educational institutions is to provide for frequent contacts between parents and teachers and establish the necessary rapport between them in the best interests of the child's education. That is why parent-teacher associations are given an important place in the general framework of educational machinery.

In what way can parents help in improving the quality of the schools ? Essentially, the improvement of the school has to involve local people who are personally interested in the improvement of the school. The number of elementary and secondary

schools with which we are concerned in India is something of the order of 500,000; the number of children attending these schools is more than 67 millions. It is necessary that each primary, middle and secondary school should have a parent-teacher association. Unless the movement is thought of in this big way there can be no real impact on the quality of education imparted in these institutions.

Everybody knows that an elementary school must have certain indispensable equipment—like chalk, black-board, globes, maps, etc. But if we go round the elementary schools in this country we will find many of these things are missing. A gifted Director of Public Instruction in Madras was responsible for starting a movement in 1957 for mobilising community effort for the improvement of schools, which has now excited admiration all over the country. A number of elementary schools in Madras were without equipment; in many of them there were no minimum sanitary conveniences, most of the children were not able to pay for textbooks, and many of the schools did not have even chalk pieces and black-boards. It was felt that there was no use asking the Government for more and more money when even the minimum was not available. It is thus that the movement was started. Meetings were held in District headquarters, Taluk headquarters, and even villages to which the parents and prominent people of the locality were invited. The school authorities explained the need for essential basic needs of the schools and appealed to the people to contribute in cash and kind for the betterment of schools. Once the facts were explained the people realised the need for assistance. In addition to cash, people made contributions also in the form of books, furniture, clothes etc. Public enthusiasm was roused by this move for direct involvement in the educational process. There is a big difference between what Government does and what the people do. The movement for school betterment through public and parental cooperation is spreading rapidly in Madras. Apart from the monetary and other value of the contributions made by the people, what is important is that there is a feeling of satisfaction in everyone who has contributed to the betterment of his own children's schools. This kind of involvement of parents in the improvement of quality in education should form a part of the technology of education in the developing economies.

Parent's Role

An example of what can be done by the involvement of people is the question of mid-day meals. Mid-day meals can stimulate better attendance on the part of pupils. It can also help in the better nutrition of children. In Madras, children were asked to bring rice in match-boxes. A number of children brought them as a match-box full of rice was no great burden on most homes. With the accumulation of rice brought by the children in the match-boxes, some schools were able to start a mid-day meal scheme. The other people got excited and enthused and said that they were prepared to give so much money, grains, oil, etc. The cultivator said that when he reaps the harvest and is approached he would be glad to contribute according to his capacity. When a person gives this kind of contribution he is much more emotionally identified than if he pays a custom duty of Rs. 100, sales-tax of Rs. 50, etc. When a person is compelled to make a contribution—and taxes are compulsory levies—he does not get a sense of identification; on the contrary he develops a critical attitude. When he meets the expenditure for the local institution as a result of his own volition, he gets involved. It is public and parental involvement which is required and which leads to an improvement in the quality of education.

Many children feel handicapped because their parents do not take any interest in what they are doing in the school. If the parents start participating in the various activities of the school, then the children also will feel that they are not being sent to schools merely for being got rid of but that their parents are also interested in what they are doing. And that very parental interest, the fact that parents are coming from time to time to the school and meeting the teachers, will have a healthy psychological effect on the attitude of the children. Similarly, the teachers at the moment have a feeling that their work is not being appreciated; on the contrary many people seem to think that the teacher is largely responsible for the bad quality of education. So the teacher loses all enthusiasm. The best people do not join the teaching profession partly because there is neither monetary nor status attraction in the job and partly because most people are critical of the teacher. A vicious circle thus emerges and makes for the continuing poor quality of education. If, however, there are

parent-teacher associations and the teacher finds that parents and citizens are taking constructive interest in what he is doing, he will feel that he is being treated as a useful human being. This itself will have a great effect on his morale and therefore on the quality of the education that he imparts.

Teaching like agriculture is an occupation where personal interest plays a large part in increasing productivity. This is not the case with many other occupations where one could be mechanical in one's work. Both in agriculture and in teaching, work can never be mechanical. And if the teacher gets interested, in spite of all the handicaps, he will give a better account of himself and produce a better effect on the children. If he is not interested, in spite of all the qualifications and the equipment he may have, he will not do so much good to the children. So the most important thing for improving the quality of education is to excite the interest of the teacher, make him think that he is doing something big, give him a sense of belonging. This can best be done, not only by giving national awards or presidential awards, but, by making the community, parents and pupils, think highly of the teacher. If parents meet him and ask what he is teaching, what the new things he is doing are, how he is stimulating interest and arousing curiosity in the child, how he is classifying the children, how he is making them work better, etc., this would make the teacher take more interest in his work. That will be a more effective method of involving the teacher and making him give his very best than impersonal appreciation or just monetary reward. If we want to motivate the teacher and make him take real interest in his work, then it is the local community which must appreciate his work.

The parents should not, however, behave like employers. The parents are not their employers and the parents are not there to take the teacher to task. The parents should be there only to understand and find out that which is happening. If the parent uses his position, not for rebuking the teacher but for showing intellectual interest in the teacher's work, the teacher would be more responsive to the needs of the children and the community. So, it is not merely by giving money or equipment that parents can help, but by displaying a positive and helpful interest in his

professional work as a teacher that they can make the most impact.

It is good to have frequent meetings of the parent-teacher association. It is only by the formation of clubs, groups and associations—the parents coming into contact with teachers, the parents regarding themselves as part of the educational system, the teachers regarding the parents as part of the educational process—that we can bring about the improvement in quality that is required. It is essential that there is this kind of getting together and establishing a positive link of understanding and appreciation between the parents and the teachers. To be effective, however, parent-teacher associations must function not so much at the national or even State level but at the local grass roots level in the many elementary and secondary schools that abound in our rural and urban areas. The promotion of such associations should therefore be included in the educational programmes of the developing economies and Governments should be prepared to give them some measure of financial assistance.

The parent's role, however, is not confined to his taking an active part in parent-teacher association and in giving his child a feeling of being personally interested in his school and its activities. He has also to fashion his own home and its way of life to suit the requirements of his child's healthy educational development. He must cultivate some technical understanding of child psychology and help in securing healthy responses from his child to the various stimuli that abound both in home and school. It is useful for parents to exchange parental experiences in regard to the educational problems of their children and also get technical guidance, where necessary, from responsible teachers or educational counsellors. Parents have to learn to converse with their children, if they want to play a positive role in their educational development. The whole process of education will undergo a salutary change and the technology of education will improve if child psychology and the place of the home in the educational process were to form a part of the general education imparted in our schools and colleges. This should be accompanied by including in the curricula and syllabi of teacher-training institutions the role of the parent in education and the place of parent-teacher associations in the educational machinery.



PART SIX

*Some
Indian
Problems*



Language and Human Resource Development

The problem of communication between the masses is not so difficult in the case of unilingual countries like England or France or Germany. There inter-communication among the masses is simply a matter of universalising literacy. In the case of a multi-lingual State like India, however, the problem is not merely one of literacy in one's own language but also in an additional language which would be understood by all the masses of the country. Obviously every Indian, whether boy or girl or adolescent or adult, must be literate in two languages, his or her mother-tongue, and a common or link Indian language. The Indian Constitution recognised this need and made a specific provision to meet it. Hindi in the *nagari* script was to be the link language; and education was to be free and compulsory up to the age of 14. Unfortunately, the adult did not figure in the picture the directive principles containing no clause on either adult literacy or adult education. After 16 years of independence and 12 years of economic and social planning, we find that adult literacy is still far from being universal, that for all practical purposes there is no effective link language among the multi-lingual masses, and that even in terms of elementary education, universality still remains a goal to be achieved in the future. We have therefore not been able to establish enough of inter-communication among the Indian masses, whether young, old or adolescent.

In India today, communication among the people is confined to the university-educated class who use the medium of English for this purpose; while among the masses, who speak one or other of 14 Indian languages and do not have the benefit of university education and are not likely to do so, there is no common medium of communication. The masses of India do not know of each

others' cultural heritage or current ideas; it is difficult for them, therefore to understand one another, let alone build up a common sentiment and common attitudes. Naturally, they can fall an easy prey to forces of parochialism, linguism, and dissension. It is imperative therefore that effective means are provided for inter-mass communication in India. The ideal way of doing it would be to use only one Indian language. But this is not possible. It is not desirable either, for India is a multi-lingual nation, with each language having a long and a proud history; and all the Indian languages have the right to be treated as, and are in fact, national languages. The Constitution therefore provided that one of these Indian languages, Hindi as the one spoken by the largest number of people in the country, should be given the status of the nation's official language. It followed that people whose language was other than Hindi were asked to study Hindi as well. Many among the non-Hindi-speaking people resented this as imposing a differential burden on them, even though they agreed in principle to the need for having one language for inter-State mass communication. They felt that if they were required to learn Hindi in the interests of national unity, the Hindi-speaking people should also be required to learn one other Indian language, thereby not only equalising the linguistic burden but also giving concrete evidence of Hindi-speaking people's interest in and respect for other Indian languages. There the matter stands at present. In the meanwhile, like in the story of the monkey and the cats who fought over their share of the cake, the English language has done well in this controversy and has now acquired the status of an associate official language for the Indian Union. It has also been agreed that until the non-Hindi-speaking people voluntarily adopt Hindi as the official language, they will continue to have the benefit of using English as an additional official language.

The whole history of this abortive attempt to introduce Hindi by law as the official language of the country has a moral which the advocates of a common script for India should also remember. If people were unwilling to accept Hindi as a compulsory additional language, they would be even more unwilling to substitute another script for their own language. What must be made clear beyond doubt is that there is no proposal to replace the existing script

of the Indian languages by one common script. The suggestion should be that, in addition to its own individual script, facilities will be provided for all Indian languages to have a common script, so that it should be easy for an Indian to study any other Indian language and not merely Hindi or any other dominant language. If there is one common script in which it is possible to study Tamil, Telugu, Kannada, Malayalam, Bengali, Hindi and Marathi, then the possibilities of inter-communication among the Indian masses open out on a scale undreamt of so far in Indian history. Hitherto, it is the classes in India that have been able to understand and communicate with each other, successively through Sanskrit, Persian and English, while the masses have never had this privilege, their only medium of communication being religion, festivals, scriptures and pilgrimages. Now, with a common script in which all Indian languages can be learnt—the suggested script is the *Devanagari* script that is now common to Hindi and Marathi and has a close affinity to Gujarati—it should be possible for a student by learning two scripts namely, his own script and the common script, to obtain the key not only to his own language but also to all the other languages of the Indian Union. Where he likes, he can study his own language also in the common script, but this will be entirely at his own option. In all cases, he would have the liberty to study his mother-tongue in its own script. In other words, the adoption of a common script is really intended for the benefit of those who want to study Indian languages other than their own and to facilitate communication between all the different Indian languages.

The adoption of the *Devanagari* script for this purpose will mean a certain advantage to the Hindi-speaking, Marathi-speaking and possibly Gujarati-speaking Indians to learn other Indian languages. But this cannot be helped. To argue from it that we should have the Roman script in order that all Indians should have equal difficulty in learning any Indian language other than their mother-tongue would be carrying the principle of inter-lingual equality too far; and it may well smack of a certain jealousy and intolerance that would be difficult to reconcile with the desire to achieve national unity and emotional integration for this vast country of ours. Moreover, there are many difficulties in getting

the Roman script adjusted to all Indian languages; there are special difficulties in using it for writing purposes because of the number of diacritical marks involved, which do not arise when we are using it for writing the English language. Moreover, we have a long established and traditionally venerated script in *Devanagari* and it would not be conducive to the self-respect of the Indian nation to discard it unless there are overwhelming reasons to do so. Under the circumstances, the Chief Ministers' suggestion of *Devanagari* as the common script for the different Indian languages should be accepted. It would of course be always open to any State Government not to adopt this recommendation, but equally logically no individual State Government can exercise a veto on the right of other State Governments to use *Devanagari* as an additional script for their own language and as a common script for all other Indian languages.

The following programme of action is suggested for facilitating the use of *Devanagari* as an additional common script for all Indian languages:

- (i) An expert examination of the *Devanagari* script should be made with a view to ascertaining what changes, if any, are necessary in order to make it functionally adaptable for the different Indian languages. Simultaneously, the script should be re-examined from the point of view of typing and printing convenience. Since it is to be a common script for all Indian languages, the special prejudices of the current users of the *Devanagari* script for their own languages like Hindi and Marathi should not be allowed to stand in the way of the required functional reform in the *Devanagari* script. It must be added that the numerals employed in the common script should be Arabic and not Hindi numerals. And, as far as possible, scientific and technical terminology employed should be common to all the Indian languages. There is no reason why we should not bodily lift from the English language scientific and technical vocabulary for which it would be difficult to find common equivalents in all Indian languages.

- (ii) A centre should be set up for the immediate production of elementary text-books, in the *Devanagari* script for the different Indian languages, and simultaneously, dictionaries should be compiled in the *Devanagari* script of a bilingual, trilingual and multi-lingual character.
- (iii) Arrangements should be made at an early date for the teaching of non-Hindi Indian languages in the Hindi-speaking regions. This may be started from the fifth year of school, students being given the option of choosing one of two non-Hindi languages and arrangements being made to see that all the Indian languages find a place in one or other school within the region.
- (iv) Arrangements should be made in the non-Hindi speaking regions to teach both Hindi and, where acceptable, one other Indian language in the *Devanagari* script. This should also be started at the fifth year of school. Teaching of the mother-tongue should be in its own script and should commence from the first class.
- (v) Immediate arrangements should be made and on a vast scale for transliteration into the *Devanagari* script of important classical and current works in the different Indian languages. A programme of at least 1,000 titles a year should be taken up for such transliteration from each Indian language.
- (vi) Training centres should be established at a number of places for the training of teachers in the *Devanagari* version of each Indian language. It goes without saying that a person who teaches any Indian language in the *Devanagari* script should be fully conversant with the native script of that language and be well-acquainted with its history, grammar and literature.

The use of a common script is not just an educational or a linguistic matter. It is equivalent to arming the entire country with a common weapon of defence. Facilitating inter-communication among the multi-lingual masses of India will be the largest single step for bringing about emotional integration and building up common sentiment of Indian nationality. The building up

of such a feeling of Indian nationality among the masses is worth much more to Indian defence than many battalions of armed forces or squadrons of aeroplanes or flotillas of naval vessels. An army can be defeated; but no nation can be conquered. Money therefore should be no consideration in implementing this programme for a common script, and speed ~~should~~ be of the essence of the programme. The whole project has to be treated as a defence project and implemented with the priority, speed and efficiency, with which one carries out the operations that are needed to place the country on a war-footing during a state of emergency. The threat to our national unity arising from want of inter-lingual communication is like the threat of war; and it must be faced and conquered with similar firmness and determination.

In contrast to the masses, the classes in India are linked through English, but have no link whatever with the masses whose languages are different from their own. In fact, they are even de-linked from their own lingual masses because of the alien medium of instruction through which they climb into the ranks of the *elite*. And class conflict and social instability is likely to develop if the classes have no intellectual and two-way communication with the masses. It is regrettable therefore that no attempt is being made to stimulate a two-way traffic of communication and understanding between the classes and the masses through media of instruction that are common to both at least in each individual State. This is an unnatural situation, and is bound to hamper the acceleration of economic growth through better utilisation of the country's human resources.

The medium of instruction at the pre-university stage is the mother-tongue; and then at the university stage, the medium changes into a foreign language, with the result that the majority of those who go in for higher education are all the time struggling with expression, go in for memorising, and get no real or living contact with the subjects they are supposed to study; and many of them fail in their examinations. Intellectual resources thus get under-utilised, creative thinking gets killed at birth, and higher education gives only an inadequate stimulus to social or cultural or economic development. Those who are able to handle the

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language well are those who study in convents and other expensive schools where the medium of instruction is English. These belong to the higher income groups and their proficiency only results in the accentuation of inequalities of income and wealth and makes nonsense of the so-called equality of opportunity that we all swear by as our social ideal. In addition, they constitute a class who, with the exception of the politicians, do not have any dialogue with their own people, but get together in a separate caste that tends to look beyond their national frontiers for appreciation and communication. There is no escape from this position except by changing the medium of instruction into the mother-tongue at the higher stages of education, which will automatically ensure greater equalisation of opportunities between the rich and the poor, the *elite* and the masses. This of course has to be supplemented by making Hindi as a link language, as suggested earlier.

But this is no argument for the abandonment of English as a language of comprehension in higher education. That English is the most comprehensive store-house of modern knowledge and also the most widely used medium of international communication are both indisputable facts and cannot be ignored by any educationist who is a votary of knowledge. Only, the inference drawn from these facts is unsound. These facts are as true for Russia or Germany or Japan or China as for Sweden or for Poland. But this does not make educationists of those countries demand a change in their media of instruction from their native languages to English. Even little Denmark or Norway or Finland have not gone in for a change in their media of instruction because their languages are neither the world's most comprehensive store-house of knowledge nor the most widely used media for international communication. All these countries of course provide for instruction in the English language; and their systems of higher education involve the use of English material. Learning the English language as a means of access to modern knowledge is one thing; using it as a medium of instruction is quite another thing. All that the arguments outlining the wealth of English language lead to logically is the need for including in our higher education such degree of competence in the English language as

to make access possible and effective to the vast panorama of knowledge available through that language.

At the same time, it is not possible to make an abrupt translation in the media of instruction from English to the Indian languages. The Indian languages are still comparatively undeveloped for usage for modern and scientific knowledge in terms of either their vocabulary or their books and journals. Immediate transition to the mother-tongue may make for more command over and better lucidity in expression, but the content will be poor, as there is not enough of modern knowledge in Indian language as yet. Indian languages need development. This will be facilitated by good translations of modern books from English and other foreign languages. It is, however, impossible to go on translating into Indian languages every English book or journal as and when published. This will need an army of translators in various languages and by the time they have completed their work and it is printed, the material may become obsolete. The inevitable result will be a fall in standards, if the student has to rely for knowledge only on the books and journals printed in his own language. This is what will happen if reliance is placed mainly on what may be called the 'translation thesis' for the purpose of effecting a change from English to the mother-tongue as the medium of instruction.

The measures required are not just translations of books written in the English language. No doubt there must be some translations, but no translation programme can give our students or teachers or other educated people the knowledge that knowing the English language well enough to read and understand writings in the English language can give them. An essential condition of replacing English by Indian languages as media of instruction therefore is the giving of adequate competence in the English language, paradoxical though this may appear to the layman. Thus, the student and the teacher must know English and use English books and journals; but the lectures will be in the mother-tongue, the answers will be written in the mother-tongue, and subsequent writings, original and otherwise, will be in the Indian languages concerned. In other words, while the medium will be the mother-tongue, for some time at least, the knowledge will

mainly be through English and the student must have enough mastery over the English language to read and understand these books. The students whose mother-tongue will be the medium of instruction but who are made to read the bulk of their books through English and acquire the bulk of the written knowledge through English will write their answers in their mother-tongue. They will be the persons who, when they become lecturers, professors, journalists, etc., will write books and other literature in their own language. Thus, over a period of thirty to forty years, every language will develop and become rich in knowledge, as European languages have developed over the last hundred years. Then, in the course of a few decades, we will have foreigners learning Indian languages to acquire the knowledge contained in their writings, even as today Japanese and Russians learn English, and Americans and Englishmen learn Russian and German. This may appear to be an idle dream today. But it will become a living and powerful reality if only we have the strength of mind to believe in ourselves, the wisdom to combine our own media of instruction with continuing use of English for extending our knowledge, and the patience to put up with the stresses and strains inevitable in the transition from English to Indian languages as media of instruction. With the size, numbers, heritage, and intelligence that India has, we should be making contributions to knowledge many times that of the small countries of Europe who today lead us in the intellectual world. And we can do so if only we will universalise knowledge among our people and this we cannot do as long as we use a foreign language as the medium of instruction in higher education.

To conclude, while the mother-tongue must be the medium, English must continue as a language of comprehension and the bulk of knowledge that a student obtains in a university must be obtained, for a long time to come, through the written English word and wherever necessary also supplemented by the spoken English word. But the medium of instruction must be his own mother-tongue. Then, in the course of 30-40 years his language would have been developed both in vocabulary as well as in scholarly content. As far as the masses of people are concerned, the only link language can be Hindi. English may be the only link

language for the classes but classes do not constitute the nation. The nation primarily consists of the masses. In order to make it as easy as possible, Hindi could even be taught in the regional scripts and we can have a great number of books written in different languages transliterated in the same script for each linguistic region, so that it should be possible even for a person familiar only with his own script to read books in a number of other Indian languages. The better and more economical alternative would be to use *Devanagari* as an additional common script for all Indian languages, as suggested earlier. When an effective bridge is thus established between different Indian languages, it will be found that there is very much common between Telugu, Bengali, etc. and Hindi, in stories most certainly, in tradition and content most emphatically, but even in language, it will be found that so many words are common. Sometimes in accent they will be different; sometimes the meaning will be different because Indian languages have not only been influenced by Sanskrit, but also by Persian and to some extent by Arabic and even English. These are the things which have spread all over India; wherever one goes, there will be found some Persian influence, a great deal of Sanskrit influence, a little Arabic influence and a little English influence in the Indian languages. For a multi-lingual country like India, the solution of the language problem is essential not only for educational reasons but also for the purpose of establishing emotional integration and making the best collective use of human resources embodied in her vast population.

The Role of Youth in Emotional Integration

One need not be unduly perturbed by the pessimistic reference made earlier to the deterioration that is alleged to have taken place in the state of Indian youth today. It is always the habit of an older generation to glorify in retrospect its own state when it was young and to feel that things have deteriorated since and express concern at the state of youth now. There are many solid facts to show that the young of today are in many ways more competent and better trained than those who have left their youth long behind them. It is also understandable that, freed from the inhibitions and constraints imposed by the overtones of foreign rule, the individual suppression required by the need to throw off the foreign yoke, the standards of austerity and plain living associated with the Gandhian era, and the guilty reluctance to associate with foreign things or praise foreign ways of life, the younger generation of today have swung in the other direction and are expressing their new Indianness by becoming apparently less Indian in their values and ways of life. It must not be forgotten either that the example set by the old has been a contributing factor to some of the frustration, diminished idealism, and somewhat futile restlessness on the part of the young; for while the old have changed in their ways, their words still retain the form and content they had when young, and this contrast between professions and practice has done more to demoralise the young than anything else in post-independent India. It is no use therefore casting stones at the younger generation of India today. The glass with which our houses have been rebuilt is too conspicuous to warrant this type of diversionary activity on our part. If India faces a crisis today and, alongside, also its youth, the older generation are as much responsible as the young; and

they cannot escape it by reference to their past professions or even achievements.

But this does not mean that the young do not have a problem; or that they are not also a contributory factor to the crisis that confronts the country today. They are the ones who will suffer the most by any continuation or development of the current Indian crisis. They are also the ones who can do most to conquer this crisis and take their country forward on the march towards progress and justice, economic, political and social. Let us then turn more concretely to what the youth of India can do in the current Indian context.

The first thing that the youth of India has to realise about the freedom of India is that it requires positive action on their part for its maintenance. It is comparatively easier to secure freedom than it is to maintain it; and this is especially so for a vast country like India with its complex of communities, castes, languages and local histories. India has never been a nation in the modern sense of the term, though she has always had cultural unity and a certain consciousness of Indianness, which is more deep-rooted and has more vitality than, for example, the consciousness of Europeanness among the Europeans. It must also be remembered that when, on previous occasions in her history, India did achieve a large measure of political unity, it was largely on the basis of conquest either by foreign forces or by one or other of the areas or groups forming a part of India; and it is the first time in our history that the various areas and groups in India are associated together, voluntarily and by choice, into one political entity. It is also the first time in Indian history that a political democracy of the western type has been established on a national scale and that all adult citizens have been given the franchise. All this means that every resident of India has to feel an emotional bond of attachment to other residents that is more intimate and more powerful than he does with residents of other countries. It also means that every region in India feels more attached to the inviolability and sanctity of every other region in the country than it does with respect to regions outside the country. In simple words, it means that Indians must feel towards India and Indians as Britishers do with regard to Great Britain

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and Britishers, or Frenchmen to France and Frenchmen or Japanese to Japan and Japanese, or Americans to the United States and Americans, or Russians to the Soviet Union and Soviet citizens. This does not mean that Indians should deny the values of world unity or human brotherhood any more than it means that either Englishmen or Frenchmen or Japanese or Americans or Russians should deny world unity or human brotherhood. What it does mean, however, is that Indians understand one another and communicate with each other more freely than with foreigners, that they are familiar with each other's literature, culture and traditions, that they have mutual regard and respect, that they are willing to share their economic and other resources with one another, that they are physically conscious of the beauties of the geography that is in their respective regions, and that they are prepared to fight for and die, if necessary, in defence of the territorial integrity of every part of the country and the honour and the self-respect of every section of their people. When we talk of Indians in this context, what is meant is all Indians, the educated and the uneducated, the rich and the poor, the urban and the rural, all who enjoy the proud privilege of citizenship of the Indian Union. It is for the youth of the country to create these conditions; and when they do, our unity as a nation will not be just a response to a special crisis or emergency but take on the form of a continuous and positive phenomenon with all round favourable effects on our every day economic and social life.

The first thing to do is to learn to communicate with fellow Indians. To think that this can be done through English is a foolish dream. The percentage of Indians who know English is significantly small; and the kind of English they know, the extent of command they have and the use they can make of the same to express their deepest feelings or their noblest thoughts, are all too restricted and insufficient even for this small minority of English-knowing Indians. And between this small minority and the vast majority of their fellow-countrymen who have not been to a university and do not therefore know enough English, there is a vast and widening gulf that has in it the most threatening political possibilities. If young men and women really want to communicate with the vast masses of fellow-countrymen, they

must talk to them in their own language. There are fourteen major languages in India and it is not possible for the youth to learn all the fourteen languages. But we can certainly do more than we are doing now. Take Hindi which we want to make the national language of inter-Indian communication. How many Hindi-speaking intellectuals write in the Hindi language ? Do the great Hindi-speaking scientists, technicians, administrators, economists, sociologists, philosophers, even journalists write in Hindi ? Do the Hindi public turn to Hindi writings for their intellectual food in respect of the different fields of modern knowledge ? How many colleges and teachers of the Hindi region can boast of having written their best work in Hindi ? And if they do not, how will the language grow ? How can a vocabulary develop except by use ? In recent years Hindi has become the medium of instruction in some sectors of higher education. But this has not been accompanied by a corresponding enrichment of modern Hindi literature in science, technology, the social sciences, or even the humanities. This is because, simultaneously with the increasing use of Hindi in colleges and institutions of higher learning, there has been a corresponding increase in non-resort to English media of communication of modern knowledge. And this has led to a fall in academic standards. Ease of expression has increased, but the content expressed has tended to decline, and this has tended, broadly speaking, to place the Hindi areas at a comparative disadvantage in respect of modern knowledge and therefore the cultivation of the modern or the scientific temper. But discarding English as the medium of instruction should not mean discarding English as the most important key to modern knowledge. It will be a long time before the Indian languages, including Hindi, can become adequate enough keys to all modern knowledge; and in any case, English will always remain a superior key. What is required therefore is for Hindi to become the medium of instruction together with a vastly greater use of books and journals in English for acquiring modern knowledge. This can be done only if we abandon the translation-thesis of the change-over from English to Hindi, or any other Indian language as the medium of instruction. There must, of course, be some basic books in Hindi for each subject

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and each paper taught in the university. But these must not be translations; and, if there are to be translations, they should be translations of books specially written or adapted for the purpose by the best Indians in the field, writing in the language they can express themselves best in. Only then will these books be really suited to the requirements of Indian students and have that characteristic flavour that distinguishes Indian from foreign writings. But in any case, such books can only be few in number, at any rate till such time as the new products of the Hindi media of instruction grow up and write their own original contributions to modern knowledge in Hindi. Meanwhile, and in fact for a long period, our students will have to rely on books and journals in English for the bulk of the content of the modern knowledge that they acquire. This cannot be done through translations. Translations are generally poor; they can never appear in time; and one cannot hope to compete with the more advanced nations in the field of modern knowledge without the ability to read and understand such powerful international media of communication as English and possibly also German, Russian, and French. It is therefore, imperative that, side by side with the introduction of Hindi as the medium of instruction, students are also given a much greater competence in the knowledge of English as a language and also made to cultivate to a much greater extent than they do now the habit of reading books and journals written in the English language. But the lectures must be in Hindi; and the answers should be in Hindi. And Hindi intellectuals in all fields of knowledge must do their writing, their best writing and not merely text-books, in Hindi. If this is done over a generation, Hindi as a medium of modern knowledge will grow and develop and acquire at least the status that Japanese has acquired over the last fifty years; and possibly, after some time, even the status that Russian or German or French has acquired over the centuries. Only then can one confidently say that Hindi is a developed language and is a sufficient store-house of modern knowledge and is therefore free from the charge that is now made by those who object to Hindi as an alternative to English or even one of the other Indian languages on purely functionally linguistic grounds. Incidentally, such a development of the Hindi language will also

establish free communication between the university educated classes and the non-university going masses, and thus help to bring about social integration and emotional identity.

Non-Hindi people have shown reluctance to accept Hindi as the language of inter-communication with their Hindi brethren. The feeling is human and understandable. There is a feeling of grievance that while non-Hindi speaking Indians have to put up with the burden of learning an additional Indian language on the ground of national unity, Hindi-speaking Indians are not prepared to learn an additional Indian language on the same ground of national unity. Coupled with this is the feeling that Hindi-speaking Indians are not familiar with the history, culture, and literature of their non Hindi-speaking brethren, and do not also appear keen on rectifying this gap in their knowledge. After all, we must remember that minorities are naturally prone to develop irrational fears and apprehensions about a majority; and it behoves the majority to display sympathy, understanding, and generosity in this matter. We all know that this is true in the communal field; and on the whole, the Hindi majority in this country has shown understanding and generous attitude to the Muslim and other religious minorities in post-independent India. We need to extend the same understanding and generosity to the linguistic field. Even as a communal majority cannot be changed by law or by votes; and hence the additional responsibility that rests upon the majority. This position is even stronger in the linguistic field, for here the linguistic minorities are required to learn the language of the linguistic majority, while no such condition is imposed in the religious arena. The only way in which the Hindi-speaking majority can counter the apprehensions and grievances of linguistic minorities and win them over to an enthusiastic acceptance of Hindi as their *rajya bhasha* is to learn compulsorily one or other of the Indian languages. This has been provided in the three-language formula accepted by the Chief Ministers' Conference and later endorsed by the National Integration Conference presided over by the Prime Minister. But, quite frankly, people in non-Hindi speaking areas do not believe that this is going to be implemented. The proof of the pudding is in the eating; and, so far, no step has been taken to show that a

serious attempt is going to be made to introduce an Indian language other than Hindi as a compulsory subject of study in school education in the Hindi-speaking areas. It requires a great deal of thinking, planning and preparation before the many millions of Hindi-speaking children are provided with facilities for learning an additional Indian language; and yet no step has been taken even to initiate the process of thinking in this matter. It is suggested that the time is now ripe—and the sands of time are running out—for the Governments of the Hindi-speaking areas to take the lead in this matter. The implementation of the three-language formula has now become much easier with the decision to use *Devanagari* as an additional script for languages other than Hindi. If the children of Hindi-speaking regions learn other Indian languages through the *Devanagari* script, not merely will it mean less strain on them. It will also mean that, within a measurable period of time, the Hindi-speaking areas will not only have learned to communicate with their non-Hindi-speaking brethren, but will also have acquired knowledge—and with knowledge also understanding and respect—of the culture and history of their fellow Indians. Thus, truly, they will have become Indians in a much more meaningful sense than ever before. In this process, young men and women can play a great role if only they will approach the linguistic problem in a spirit of humility and understanding and as a quest for the promotion of national unity and emotional integration.

There is one more important field in which the youth can play a great role in the task of national unity and emotional integration. There is the need for identification on the part of educated youth with the interests and well-being of the masses. India is not just a geographical expression; and Indians do not only mean people who all belong to the university educated classes. India means the masses of India, the many millions whom Gandhiji so feelingly referred to as the *daridra-narayanans* of the country. India's freedom will have neither content nor stability until the masses become well fed, well-clothed, and well-housed. They must have education and good health. Their economic condition must improve and also their working conditions. They must have the right to walk erect, have their human dignity respected, and their self-respect

preserved. How can this be done except by the educated youth of the country accepting it as their dedicated duty towards free India? There is an uncomfortable feeling that, after independence, the gulf between the classes and the masses has widened instead of narrowing. It is true that the poor now have the vote; and that there is a great deal which is being done for them by the Central and State Governments after independence. But this is not enough. What is more important from the point of view of emotional integration and the creation of a classless society is what is being done for the masses voluntarily and with devotion by the classes. From this standpoint, one has the feeling that conditions have deteriorated in India after independence. Most of us, who belong to the educated classes, seem to think that everything should be done only by Government and by political parties, and that the individual has fulfilled his social role merely by paying his taxes and doing his job conscientiously. This is not good enough for creating that sense of solidarity, of identification, and of mutual regard, without which there can be no real emotional integration. We should not make the mistake of thinking that casteism, communalism, linguism, and regionalism are alone the enemies of national integration. Even more important, especially from the long term point of view, is the possibility of class conflict and emotional divorce between the educated classes and the not-so-educated masses. Our young men and women should spend far more time than they are doing now in thinking of the problems of the masses and taking action, each in his own chosen sphere and according to his limited capacity, to identify himself with the masses and do so concretely, and in a visible manner. If we want the masses to get enthused and become the bulwark of new India, we have to give them the vision of a new society, where their interests will be supreme and where they can walk and function with freedom and dignity. A vision in words is not enough. The masses are tired of language; they want action, evidence, proof that the new society is coming. And who can convince them better, by both precept and example, than our young men and women. The youth must yield to idealistic impulses, pay the debt they owe to Gandhiji and the other harbingers of India's freedom, and safeguard their own ultimate interests by constantly

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bearing in mind the condition of the masses and the priority that improvement in their conditions must have over an improvement in their own conditions. I know that our educated youth are not well off themselves; but the masses are worse off, and they constitute the bulk of India. Hence the need to attempt a return, to the extent possible, to Gandhian standards in personal conduct and economic reward. The older generation cannot do this. They are tired; and also they have done their historic bit. It is now up to the educated youth to carry the torch and help in building a new India that is not only strong and modern, but also without class conflict and class hatred.

APPENDIX ONE

*Education in the
Fourth Plan—
Policies and
Priorities*



Education in the Fourth Plan— Policies and Priorities

[The author had an occasion to address the State Ministers of Education in a special conference convened by the Planning Commission at Srinagar on the 7th June 1965. The subject of his address was Education in the Fourth Plan. The address is reproduced below to indicate the thinking of the Planning Commission at that time. It must be added that the figures of outlay mentioned in the address have now undergone a downward revision in view of financial constraints. It is nevertheless the author's hope that the substance of the thinking embodied in this address will get implemented during the next five years.]

I am most grateful to the Education Ministers for having stayed on for a day more in Srinagar at my request. I am also grateful to the Chairman and Members of the Education Commission, whose report is going to make a large impact on the future of educational planning, for the courtesy of having accepted my invitation to be present at this meeting so that you could also have the benefit of their interim and tentative thinking on any problems which you might seek their guidance for. My reason for thus encroaching on their valuable time is the anxiety of the Planning Commission to establish personal communication with them in order to explain its thinking on educational planning during the Fourth Plan period, obtain their own thoughts on the same, discuss priorities, and come to an understanding on the problems of implementation. The Planning Commission is not interested in just drawing up Plans. We are also anxious to see that the targets we set are fulfilled in terms not only of numbers but also of quality and in time. This can be done only by the State Governments and their Education Ministers, as education is primarily their Constitutional responsibility. Hence this meeting.

As you know, for the last two years or so, we have been engaged in reviewing our past achievements during the first three plans and formulating programmes for the Fourth Plan. What we have done, especially in the field of education during the last three Plans, is by no means a mean achievement. In every sphere of educational activity there has been a substantial increase in the number of institutions, pupils and teachers. The number of universities alone has increased from about 27 in 1950-51 to about 65 in 1965-66. The number of colleges is likely to be about 1800 in 1965-66 as against 542 in 1950-51. The number of engineering colleges and polytechnics would be 134 and 274 respectively in 1965-66 as against 49 and 86 in 1950-51. The number of high and higher secondary schools would be over 25,000 in 1965-66 as against 7288 in 1950-51. The number of primary schools and middle schools taken together would be about 478,000 in 1965-66 as against 223,000 in 1950-51. The number of students

enrolled in schools and colleges in this country today is of the order of about 70 millions, as against about 25 millions in 1950-51. Our student population thus exceeds the entire population of most countries in the world. During these 15 years of planning, our expenditure on education has also gone up considerably. While the total expenditure on education in 1950-51, was Rs. 1140 millions, it would be of the order of Rs. 6000 millions in 1965-66, which means nearly a five-fold increase. Against this, the increase in per capita income during the period is likely to be less than 40 per cent.

It will, therefore, be seen that in terms of sheer quantity, we have made a great deal of progress in the field of education. This expansion of educational facilities does not, however, have a uniform incidence over the country. There are regional imbalances both in regard to the overall expansion and in relation to the various sectors of education. Nor have educational facilities spread evenly among various sections of population. Worse still is the deterioration in quality that has accompanied the increase in quantity. The rapid expansion of educational facilities has outstripped the resources of trained teachers, buildings and equipment. We do not have enough of proper text-books. There has been too little emphasis on real balance between the provision of general and of vocational education. While there has been some diversification of education, it has not made much impact on man-power needs nor is it geared to our development programmes. To add to all this, wastage and stagnation is found all along the line in our educational system. These are hard facts and it is in the light of the problems that they pose that we are engaged in formulating our proposal for the Fourth Plan.

The first thing we want to do is to give a new orientation and a fresh purpose to the educational system. This is to establish firmly a deliberate and purposive link between education and economic development. We want to treat education as an investment in human resources which means, in turn, that returns are required in the form of skilled man-power geared to development needs and of the appropriate categories and right attitudes. It involves reduction, if not, elimination of waste, and minimisation of cost consistent with improvement in quality. It also means diversification, terminalisation at suitable stages in the educational system, vocational guidance and educational counselling, modernisation of outlook, inculcation of a scientific attitude, building up of character, and promotion of national unity and social enthusiasm.

If education is to be effectively linked with economic development, the educational system must have terminal points at which students can give up formal studies and take to either occupational training or actual occupation; and these points must be fixed at stages which are not only educationally sound but also take into account the developmental needs of the country the constraint of resources, and the observed behaviour of our school-going population. It is also necessary to have diversification of courses beyond the first terminal point so that the students leaving at the terminal point will either go in for further training or are fit to enter employment. I may, now, proceed to place before you my tentative ideas on educational planning programmes during the Fourth Plan period.

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As a long-term objective, I would like the first ten years of schooling to be available to every boy and girl in the country, with the 10th class as the first terminal point, diversification and further terminalisation following the completion of the 10th class. For the immediate future however, I would have this pattern :

Elementary education	4+3
or	5+2
Secondary education	7+3+2
or	7+4+1
or	7+3+2

the first to cover 5 years of higher secondary education up to the Intermediate, the second to cover the existing Higher Secondary Schools of 11 years +1 year of pre-University class, and the third to cover the existing High Schools +2 years of Intermediate Arts or a junior college as the case may be.

The terminal points would be at the end of the 7th year, at the end of the 10th year, at the end of the 12th year, and then of course at the end of the 15th year. Diversification of courses should be provided at the end of each terminal point, the first to cover only agriculture and vocational training in manual skills, the second to cover agriculture, commerce, industrial training, technical training, and other kinds of training which would lead to diplomas in different fields and prepare the students concerned to man the junior ranks of the vast agricultural, industrial, commercial, technical, administrative and teaching personnel that our developing economy requires. The third terminal point would separate those who are going in for professional education of the graduate level in agriculture, veterinary and other agricultural sciences, engineering, medicine, pedagogy, commerce, science, and the humanities. The output of these has to be linked with the requirements of the economy. The fourth terminal point would be after graduation, when there will be specialised M.A. and other post-graduate courses in different disciplines. Here again, numbers have to be related to requirements of teaching, industry, and commerce, administration, research, and other relevant sectors in the economy.

It is also my opinion that there should be no need for a rigid single pattern to be imposed on the whole country. There must be room for variation and local circumstances, always subject to rational procedures for equivalence and facilitating of internal mobility of students.

All this means a considerable outlay on education. The outlay proposed is Rs. 14,000 millions on general and technical education as compared to Rs. 5,600 millions in the Third Plan, or an increase of nearly 150%. In addition, the provision proposed is for Rs. 1930 millions on medical education, Rs. 390 millions for agricultural education, Rs. 800 millions for the education of scheduled tribes, scheduled castes, and backward classes, Rs. 1350 millions for craftsman training and Rs. 1750 millions for scientific research during the Fourth Plan. In all, this would roughly be about Rs. 6000 millions as against Rs. 2150 millions for such sectors in the Third Plan. Thus the total outlay for all types of educational

programmes in the Fourth Plan would be about Rs. 20,000 millions*. This development outlay of Rs. 20,000 millions during the Fourth Plan is exclusive of the amounts which the Central and State Governments will be incurring every year on the maintenance of the educational institutions in position by the end of the Third Plan, which would amount to Rs. 5600 millions in a year during the Fourth Plan. Altogether, therefore, we hope to spend Rs. 48,000 millions on education during the Fourth Plan period.

As I told you earlier, however, education is essentially a State subject and it is on the willingness of the State Governments not only to raise adequate resources but also give the necessary priorities that the success of educational planning will depend. From this point of view, I have been rather perturbed by the draft memoranda on the Fourth Plan that have been received from the State Governments. While the total outlay on general and technical education proposed by the State Governments is of the order of Rs. 9780 millions or slightly in excess of the amount proposed in the Planning Commission's Memorandum that has been approved by the National Development Council, this is in the background of a total State plan proposal of Rs. 98,750 millions as against which the Planning Commission's figure is in the context of a total of Rs. 76,600 millions. In other words, the proportion assigned by the Planning Commission to education is 12.4% of State Plan outlay, while the corresponding figure proposed by the States is only 9.9%. I am referring to the global total of the States; the figures of course show variation between the individual States. I also find that the percentage allotted by the State Governments to education is exactly the same as in the Third Plan performance, even though the Planning Commission and the National Development Council have allotted it a higher percentage in the Fourth Plan. We are taking up this question with the Chief Ministers of the States when we start discussing with them individually their total Plan outlays as well as the sectoral distribution thereof. We begin these discussions on the 10th of June and will go on till the 22nd July. Meanwhile, I thought it my duty to draw the attention of the State Education Ministers to the need for taking up this question themselves. They must remember that as the total Plan outlay proposed by the States exceeds the amount available by more than Rs. 22,000 millions or about 30%, there is bound to be a cut in these outlays. If the cut falls on education, there is no hope of fulfilling the educational programmes visualised either by the Planning Commission or by the State Education Ministers. Education in the States must get the same priority as has been put forward in the Planning Commission Memorandum, subject of course to marginal differences due to the special circumstances of the individual States. I trust that the Education Ministers will exercise all their influence and persuasive ability in seeing that this is done before the Plans get finalised. I am giving these facts at this meeting, as I wanted to give advance notice to the Education Ministers that they have got to be vigilant, if they want to see that the amount they have put forward is retained intact in the Fourth Plan proposals.

Assuming that we all succeed in retaining for education the place that has

*Memorandum on Fourth Plan, Planning Commission, October, 1964.

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been proposed for it by the Planning Commission and the National Development Council, I would like to draw your attention to some of the basic factors in our educational planning which need your whole-hearted and positive support. The emphasis in educational planning in the Fourth Plan is on the linking of education to developmental requirements, improvement in quality, minimisation of unit cost without impairing efficiency, and satisfaction of the felt needs for education by the vast masses of school-age and college-age population to the maximum extent possible consistent with our resources and our ingenuity in improving our educational technology. All these no doubt appear to contain an element of mutual contradiction; but the contradiction is only apparent. With intelligent and purposive planning, it should be possible to achieve all these objectives. That is the belief that underlines our educational planning in the Fourth Plan; and hence the Planning Commission's letter to you on 'guidelines' and hence my personal request to you here to take the educational plan as a whole with its proposed priorities and techniques for achievement rather than consider them in isolated parts.

Above all, I would like you to consider educational programmes as projects in the same way in which we draw up our industrial projects. This means that we are not only clear about the objective we want to achieve but also the time phasing involved, the advance action required, the inputs needed in terms of both materials and skills as also incentives, the administrative machinery and coordination required, and the dovetailing of all these in both time and space in order to see that the desired targets are achieved. This would also require the break-up of the State Plan not only in terms of sectors but also in terms of districts and of blocks, for only by territorial planning in detail can we hope to achieve the objectives we have for either the nation or each individual State as a whole. I think that, in each district, there should be a district plan, setting out the increase in various educational institutions and what is required in terms of staff, equipment, building, etc., and linking up that programme with the programme for agriculture, industry, transport and with all other developmental programmes that are going to be taken up in that particular district.

Let me now refer to a few specific problems on which we need your understanding and cooperation. If the stress on reduction in wastage and stagnation is to be implemented, we have to make adequate provision in our Plans for incentive items like mid-day meals, free text-books, supply of uniforms, etc. The Centre will play its role in this matter, but the States also have to make their contributions. In view of the shortage of resources, I would suggest in this connection a widespread adoption of the methods used by the Madras Government in raising local public contributions for the betterment of their elementary schools. They have been holding district conferences for this purpose and have succeeded in raising more than Rs. 50 millions for bettering equipments in their schools. They have also been able to finance nearly one-third of their vast mid-day meal programmes by local public contributions. I have no doubt that the public in other States is as full of social enthusiasm as in Madras. All that is required is determination on the part of leadership in the other States to tap this resource-potential and organise their efforts to do so on a campaign

basis. I sent an officer from the Planning Commission to study the Madras experiment in public cooperation for school improvement. The report of the officer will be circulated to all the State Governments, so that this would stimulate similar action being taken in the States. I think that unless we have this kind of public cooperation, it may be difficult to put across our programmes with the present budgetary resources.

Another field where public cooperation needs to be elicited on a campaign basis is in the field of adult literacy and education. I have already circulated to all of you a report on the working of the *Gram Shikshan* Movement in Maharashtra State and I am glad to say that I have received from all of you enthusiastic letters in reply. After reading the report, one of the States sent their officers to study the methods adopted in Maharashtra and are planning to start programmes for adult education even in the current year. We have set before the country massive targets for functional literacy for our adult population, especially in the rural areas. Recognising the importance of follow-up measures to make literacy effective, we have made ample provision in the Fourth Plan for libraries in the rural areas and for book provision suited for neo-literates on a large-scale and in different Indian languages. It would also be necessary to arrange continuation classes for the neo-literates where they could be introduced to the books and journals specially prepared for them. Audio-visual aids would also be helpful in the successful running of these continuation classes. While we have not made any significant financial provision for the initial imparting of literacy, we have made some provision for the payment of teachers who will be conducting continuation classes. We have to seek the cooperation of all educated people, whether school teachers or students or others, for the implementation of this programme and get their voluntary work. In my personal opinion, the spread of functional literacy in the rural areas is integrally connected with rural economic development and will have significant impact in ensuring the success of our programmes for agricultural development, cooperation, *panchayati raj*, family planning, health and hygiene, and rural industries. In fact, functional literacy for the adult is more than an educational programme; it is essentially a tool programme for all development and especially rural development. In view of this, I wonder if we should not set up a special organisation in every State and also at the Centre to take up this programme on a campaign basis, with representation not only for the concerned departments but also for interested non-official agencies and workers. The programme will have, of course, to operate within the sphere of the Education Ministries, but it will have to seek much wider inter-departmental and non-official cooperation than in the case of other programmes.

Another field for which I seek the special interest of the Education Ministers is the technology of education. By this I mean the adoption of education techniques that will lead to reduction in cost without impairment of efficiency. This may seem a contradiction in terms but leading educationists will tell you how it is possible. As I told you before, we have to meet the demand for expansion; we have to strive for quality; but at the same time, our resources are limited. Hence the importance of seeking techniques that will help us to make our limited

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resources go longer in meeting our educational demands. The techniques proposed are:

- (1) Expansion of existing institutions to their optimum viable size;
- (2) Opening of part-time courses and evening institutions;
- (3) Cooperative education in the sense of establishing a more positive link than hitherto between technical education and industry;
- (4) Correspondence courses accompanied by personal contact programmes and summer institutes; especially for elementary and secondary school teachers; and
- (5) Extended use of audio-visual equipment for teachers.

Of these, correspondence courses constitute a major element. I know that we are not used to this technique and there is some suspicion that it will not be academically efficient. I would like to point out that correspondence courses have played quite an important role in the educational system of other countries, especially in the Soviet Union. It has also played an important part in the developed Western countries like the U.S.A., the U.K., Sweden, etc., especially in providing facilities for those who wanted to combine 'earning' with 'learning'. The Central Ministry of Education and the University Grants Commission have studied this question in detail and have deliberately decided to recommend it for wide adoption during the Fourth Plan period. The Planning Commission have also studied this question and then decided to give it an important place in the Fourth Plan not only because of its being a more economical method of imparting knowledge but also because of its relevance for planned development in terms of both acceleration and social justice. Moreover, correspondence courses, as envisaged by the Planning Commission and the University Grants Commission, do not mean instruction only through correspondence; they also include personal contact programmes covering a period of 4 to 6 weeks in a year. It is my personal opinion that correspondence courses should be linked up with summer institutes, especially in regard to teacher training programmes for clearing up the back-log of untrained teachers in elementary and secondary schools. I also believe that the programme could be strengthened by a judiciously planned use of audio-visual methods, especially if we are able to develop our broadcasting machinery to a larger extent for educational purposes, and for district programmes. The Central Ministry of Education has already taken up an advance action programme in the matter of correspondence courses. I would now like the States also to take some action at least by way of designating one senior officer, whose sole job would be to initiate, organise, progress and follow-up this entire programme of correspondence courses. He will eventually be in charge of this programme and should spend the current year in familiarising himself with the problem and techniques of correspondence courses and, if necessary, visiting a few places where correspondence courses have been functioning for a long time and with success. It may be even better if some of the State Education Ministers could go to one or another of these countries and see for themselves what it means and what results it has achieved. Ideally, if I had the resources, I would certainly

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prefer full-time courses to correspondence courses. But if I do not have the resources, then, rather than either overcrowded institutions that bring about an all round deterioration in quality or deny opportunities for many who seek to enlarge their knowledge and improve their qualifications, I would certainly go in for correspondence courses. They are useful to those who break off their studies at the terminal points in the educational system, but who are nevertheless desirous of carrying their studies further while simultaneously being engaged in earning their living. We can certainly do this in a phased manner and with proper safeguards, but if we do not give it a proper place in our educational programmes during the Fourth Plan, I am afraid that some of our targets of output of skilled and professional man-power will not be fulfilled and our general target of improvement in quality will also be subject to serious erosion. I would, therefore, urge on the Education Ministers the importance of adding this new element to our educational apparatus and thereby improving the technology of our education.

I must also say a word about the approach we want to make to technical education in the Fourth Plan. As is well-known, there has been a big increase in the number of admissions because of the emergency; and in terms of our targets, there has been considerable overfulfilment. We are also aware that there has not been a corresponding increase in staff, equipment, and other facilities. The emphasis in the Fourth Plan, therefore, is on consolidation and improvement in quality. We want to see that all the existing polytechnics and engineering colleges get their full complement of staff, equipment and buildings, where essential during the Fourth Plan. At the end of the Fourth Plan, all our technical institutions will be fully staffed and fully equipped. At the same time, we are also providing for expansion of intake in order to meet the expected requirement for engineering personnel during the Fifth Plan. But we want this to be done not so much by opening new institutions as by expanding existing institutions. We believe that this makes the institutions more viable, facilitates the use of more and better equipment, and would improve quality while at the same time reducing unit cost. This expansion is provided for in all the States, but it is possible that its distribution may not be quite even. We also want to see that the new institutions which are to be opened are located in the new industrial centres that are emerging or in other existing industrial centres rather than in response to local or political pressures. This is necessary not only to give these institutions the appropriate environment, but also to facilitate cooperative education. If we do this, we will make significant advance in the utilisation of our technical education for purposes of development. The kind of approach we are suggesting for the expansion of technical education during the Fourth Plan also calls for an all-India outlook on the part of the admission authorities and the removal of all restrictions on student mobility between the different States. I am sure that such action will be forthcoming on the part of the State Governments.

There is one more matter that I would like to place before the Ministers of Education, and that is the development of Indian languages. This question has gained in both importance and urgency, from the recent resolution on language policy that has been adopted in Delhi with the concurrence of the Chief Ministers

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and of the senior Members of the Central Cabinet, including the Prime Minister. It is now all the more necessary to see that not only do the Indian languages develop in richness and functional efficiency but also do establish inter-communication between them and provide facilities for learning languages other than their own with ease and within a comparatively short period. In this country, it is essential that necessary research should be undertaken and techniques developed so that a man who knows Hindi is able to learn Tamil in a period of six months and *vice versa*. For this purpose, we are making a provision of more than Rs. 50 millions for Indian languages other than Hindi and Sanskrit. I am anxious to see that one institution is set up for each language, preferably in its own State; and that this institute will, among other things, prepare basic vocabularies, bilingual and multi-lingual dictionaries, encyclopaedias, translations and transliterations of books from other languages, and encouragement of creative writing and scientific and technical literature. In this work, the full cooperation and participation, where possible, should be obtained of the number of agencies working in this field. If more funds are required for this programme, they should be made available in the Plan. I know that many State Governments have already been engaged in promoting the development of their regional languages. I hope that this programme which is being suggested in the Fourth Plan and for which some funds are being provided will enable the State Governments to enlarge their activity in this sphere and also spur them on to provide more resources of their own for the same purpose. Adult literacy, language development, and rural libraries form, to my mind, the major plank of the general educational condition for the promotion of rural development as also for urban-rural communication, and for national integration.

Finally, I come to the most vexing of all our problems, namely, educational finance. I have already told you how important it is for all of us, whether at the Centre or in the States, to educate the country on the economics of education. We have to carry conviction to the thesis that education is investment and that it is an indispensable tool for economic development. Unless we do this, we will not get all the money we need for our educational programmes. This cannot be done, however, merely by speeches or exhortations. We have to reconstruct our educational house and link it firmly, conspicuously, and visibly, with economic development. The Fourth Plan is an attempt in this direction, but it can succeed only if the State Governments will give full financial and administrative support to their Education Ministries in their attempt to implement the Plan. This means that education in the State Plans must get at least the same priority as the Planning Commission have given it in their Memorandum. It also means that in States where educational progress is behind the national levels, a higher priority would be given to education in the State Plans. If a State claims to be educationally backward and is not prepared to give high priority to education in its own Plan, it would become very difficult to obtain national support for special assistance to that State. Educational priority means that, if, due to any reason, a cut has to be imposed in the State Plans or revenue expenditure, the cut will not fall upon education. It also means that arrangements are made in each

State to have coordination between educational planning and other sectors of planning at both the State and the district levels. On their part, the Education Ministers have to go in for austerity measures for their building programmes and go all out for securing public contributions in cash and kind for financing a part of their programmes for school betterment, mid-day meals, adult education, etc. Education will always have to struggle with financial difficulties; and unless some sectors of our educational programmes are put on a campaign basis with active support from voluntary workers and organisations, we will not be able to make a massive headway in our educational advancement.

Having said all this, I must also say that the nation has to find more resources for education. We want more resources not only for fulfilling the Constitutional Directive in regard to elementary education, meeting the demand for education at other levels, and ensuring improvement in quality and functional orientation, but also for paying our teachers at least the minimum emoluments which they are entitled to both in absolute terms and in comparison with other workers in the economy with similar qualifications, work-loads, and responsibilities. Speaking for myself, I see no escape from some kind of a cess or surcharge at both the national and State levels for finding the additional resources required to do bare justice to our teachers and place our educational institutions on a sound footing. I have no power in the matter. All I can do is to explain and educate, so that public opinion gets convinced. If this is done successfully, I have no doubt that necessary resources will be forthcoming. I would particularly like to mention to the Education Ministers that public opinion does count in this matter, and that educating the public in the economics of education will pay dividends. As an economist, I know that taxable capacity has a large psychological content and that the willingness to pay more depends to some extent upon the desire of the tax-payer to see that a defined objective which he wants is achieved. We have seen how the nation is willingly finding additional resources and on a massive scale for defence. Education, both in its material content and in the skills and willing enthusiasm of its teachers, is as much a part of defence as the armed forces; and in addition, it leads to the efficient utilisation of our human resources for economic development. Once the people are convinced of the truth of this statement, there will be no difficulty in our getting additional resources for education. The ball is in our court. We have to convince the people of the economics of education and its relevance to defence and national integration. On the way in which we operate our educational system will depend our ability to carry this conviction to the people. Hence it is that I attach so much importance to the actual content of our educational plan, the priorities and the orientation it contains, and the way in which it is implemented. Once these are given, resources will not be a hardship. I would therefore urge on my colleagues, the Education Ministers in the States, to go all out for giving the required functional and developmental orientation to their educational programmes. This is the best way in which they can also succeed in solving their problems of educational finance.

APPENDIX TWO

*Graphs
and
Tables*

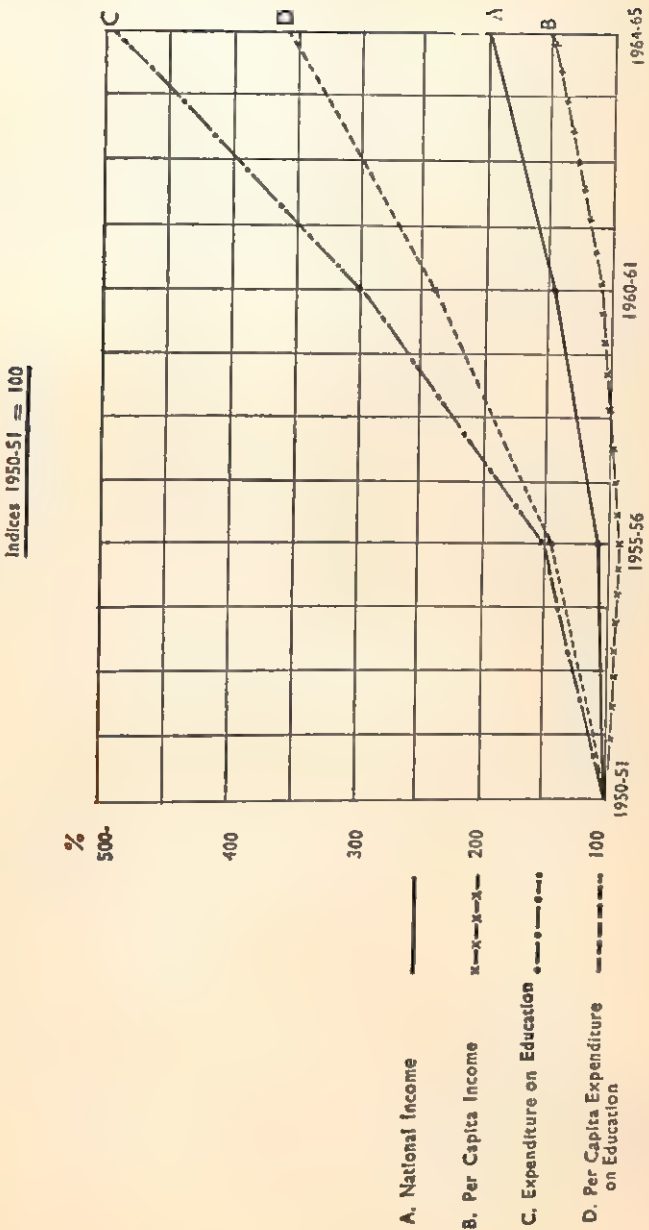


FIGURE : Growth of National Income and Expenditure on Education.

Indices 1950-51 = 100

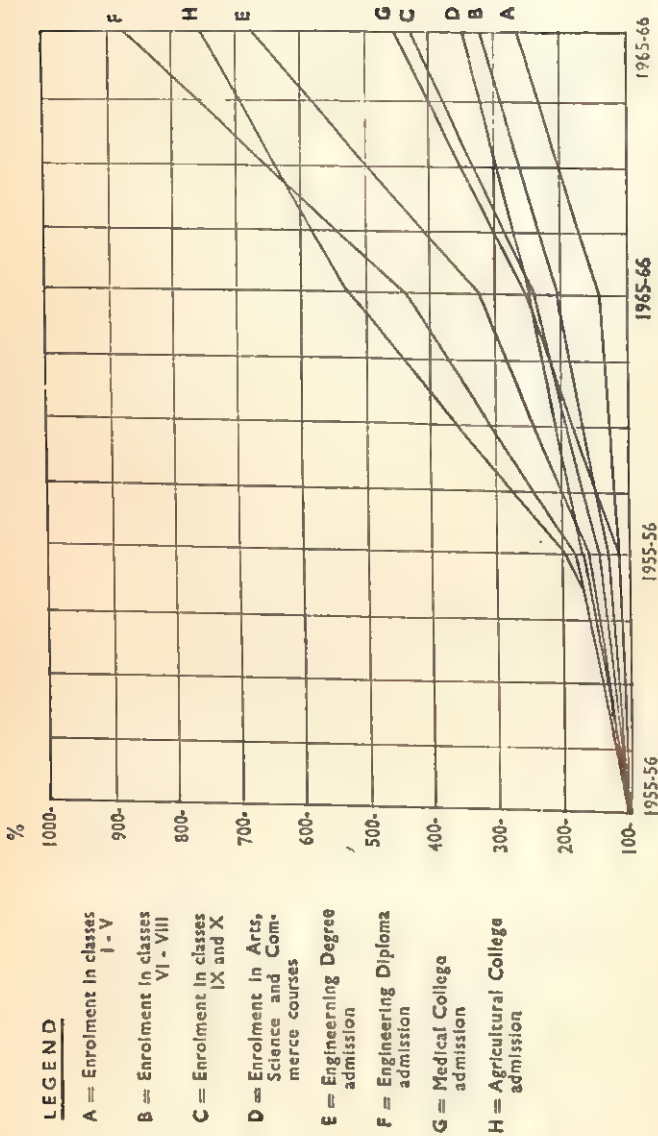


FIGURE: Growth of Education — Enrolment and admission.

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TABLE 1
GROWTH OF EDUCATION—NATIONAL INCOME
AND EXPENDITURE ON EDUCATION—1951-65
(Indices 1950-51=100)

Item	1950-51	1955-56	1960-61	1964-65
1	2	3	4	5
1. National Income	100	104.7	148.4	209.9
2. Per capita Income	100	94.7	122.3	158.1
3. Expenditure on Education	100	166.7	301.8	491.2
4. Per capita expenditure on education	100	150.0	246.9	368.8

TABLE 2
GROWTH OF EDUCATION—ENROLMENT AND ADMISSIONS—1951-66
(Indices 1950-51=100)

Unit	1950-51	1955-56	1960-61	1965-66
1	2	3	4	5
1. Enrolment in Classes I-V	100	131	183	269
2. Enrolment in classes VI-VIII	100	129	201	330
3. Enrolment in classes IX and above	100	154	243	430
4. Enrolment in arts, science and Commerce Courses in Colleges and Universities	100	172	242	364
5. Degree engineering courses (annual admission capacity)	100	143	335	680
6. Diploma engineering courses (annual admission capacity)	100	178	437	881
7. Medical Colleges (annual admission capacity)	100	140	232	460
8. Agricultural Colleges (annual admission capacity)	100	188	532	755

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TABLE 3

NATIONAL INCOME AND EXPENDITURE ON EDUCATION

<i>Unit</i>	<i>1950-51</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1964-65</i>
1	2	3	4	5
1. National Income* (Rs. in million)	95,300	99,800	141,400	200,100
2. Per capita* Income (Rs.)	266.5	255.0	325.7	421.5
3. Expenditure** on Education (Rs. in million)	1140	1900	3440	5600***
4. Per capita expenditure on Education (Rs.)	3.2	4.8	7.9	11.8
5. Expenditure on Education as percentage of National Income	1.2	1.9	2.4	2.8

*At Current prices—Source: C.S.O. Publication: "Estimates of National Income: 1964-65"—March 11, 1966.

**Figures as reported in the Ministry of Education publications: Education in India: The figures are at current prices.

***Education Commission Estimates.

TABLE 4

GROWTH OF POPULATION IN INDIA ACCORDING TO AGE-GROUP

(Figures in Million)

	<i>1950-51</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1965-66</i> (Estimated)
1	2	3	4	5
1. Total Population	361.13	400.18	438.27	494.78
2. Population in the age-group				
6-10	44.47	50.29	56.12	65.79
11-13	24.27	27.02	29.78	34.13
14-16	22.58	24.92	27.26	31.10
16-23	41.27	45.39	49.96	56.06

Appendix Two

TABLE 5
GROWTH OF PRIMARY EDUCATION

<i>Item</i>	<i>1950-51</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1965-66</i> (<i>Estimated</i>)
1	2	3	4	5
1. Number of Schools	209,671	278,135	330,399	400,000
2. Enrolment in primary/Junior Basic School (in 000's)	18,294	22,920	26,642	40,000
3. Enrolment in classes I-V (in 000's)	19,154	25,167	34,994	51,500
4. Percentage of enrolment in classes I-V to population 6-10	42.6	52.9	62.2	78.5
5. Teachers	537,918	691,249	741,515	1,050,000
6. Percentage of trained teachers	58.8	61.2	64.1	70.0
7. Teacher-pupil ratio	34	33	36	38

TABLE 6
GROWTH OF MIDDLE SCHOOL

<i>Item</i>	<i>1950-51</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1965-66</i> (<i>Estimated</i>)
1	2	3	4	5
1. Number of Schools	13,596	21,730	49,663	78,000
2. Enrolment in Middle-Senior Basic Schools (in 000's)	2,073	3,813	10,611	16,000
3. Enrolment in classes VI-VIII to age-group 11-13 (in 000's)	3,330	4,293	6,705	11,000
4. Percentage of enrolment in VI-VIII to age-group 11-13	12.7	16.5	22.5	32.2
5. Teachers	85,496	48,394	345,288	520,000
6. Percentage of trained teachers	53.3	58.5	66.5	70.0
7. Teacher-pupil ratio	37.1	40.4	40.5	40.9

Education and Development

TABLE 7
GROWTH OF SECONDARY EDUCATION

<i>Item</i>	<i>1950-51</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1965-66</i> <i>(Estimated)</i>
1	2	3	4	5
1. Number of schools	7288	10,838	17,257	25,000
2. Enrolment in high/higher secondary schools (in 000's)	3160	4714	7512	11,000
3. Enrolment in Class IX and above (000's)	1220	1880	2960	5240
4. Percentage of enrolment in classes IX and above to age group 14-16	5.4	7.6	11.7	17.8
5. Teachers	126,504	189,794	296,305	440,000
6. Percentage of trained teachers	53.8	59.7	64.1	70.0
7. Teacher-pupil ratio	25	25	25	25

TABLE 8
GROWTH OF VOCATIONAL AND TECHNICAL EDUCATION
(SCHOOL STAGE)

<i>Item</i>	<i>1950-51</i>	<i>1955-56</i>	<i>1960-61</i>	<i>1965-66</i> <i>(Estimated)</i>
1	2	3	4	5
1. Total number of schools for vocational and technical education	1557	2144	3007	4200
2. Total enrolment in vocational and technical schools	116,937	170,086	278,318	440,000

Appendix Two

TABLE 9
GROWTH OF HIGHER EDUCATION
(UNIVERSITIES, ARTS, SCIENCE AND COMMERCE COURSES)

Item	1950-51	1955-56	1960-61	1965-66 (Estimated)
1	2	3	4	5
1. Number of Universities	27	32	45	65
2. Number of University Teaching Department	237	305	479	690
3. Enrolment in University Departments	31,321	49,476	73,381	100,000
4. Teachers in Universities	3085	3497	5589	8500
5. Number of Colleges (Arts, Science & Commerce)	498	712	1039	1600
6. Enrolment in Arts, Science and Commerce Courses	302,000	520,000	732,000	1,100,000
7. Teachers	16,522	25,411	39,536	65,000

TABLE 10
GROWTH OF HIGHER EDUCATION
(ENGINEERING, AGRICULTURAL AND MEDICAL)

Unit	1950-51	1955-56	1960-61	1965-66
1	2	3	4	5
1. ENGINEERING AND TECHNOLOGY (Institutions)				
Degree level	49	65	102	134
Diploma level	86	114	195	274
2. ENGINEERING AND TECHNOLOGY (Annual admission capacity)				
Degree Courses	4120	5890	13,820	28,000*
Diploma Courses	5900	10,480	25,800	52,000*
3. MEDICAL COLLEGES				
Institutions (No.)	30	42	57	85
Annual admission capacity	2500	3500	5800	11,500
4. AGRICULTURAL COLLEGES				
Institutions (No.)	19	30	53	66
Annual admission capacity	1060	1989	5634	4000

*Approved admission capacity

TABLE 11
GROWTH OF TEACHER EDUCATION

Unit	1950-51	1955-56	1960-61	1965-66
1	2	3	4	5
Teacher Training Colleges (No.) (Secondary Teachers)	53	107	216	250
Enrolment	5781	14,280	19,500	26,000
Teachers Training Schools (No.) (Elementary school teachers)	782	930	1138	1300
Enrolment	70,063	90,914	122,682	160,000

TABLE 12
GROWTH OF LITERACY

Unit	1950-51	1955-56*	1960-61	1965-66*
1	2	3	4	5
LITERATE POPULATION (Figures in million)				
Total	60.1		105.3	
Men	46.3		77.8	
Women	13.8		27.5	
Urban	24.8		37.1	
Rural	35.3		68.2	
PERCENTAGE OF LITERATE POPULATION				
Total	16.6		24.0	
Men	24.9		34.4	
Women	7.9		12.9	
Urban	34.6		47.0	
Rural	11.8		19.0	

*Figures not available



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NOTE: The following abbreviations are used:

<i>def.</i>	defined	■ <i>qirt.</i>	quoted in relation to
<i>desc.</i>	described	<i>rirt.</i>	referred in relation to
<i>disc.</i>	discussed	<i>stat.</i>	stated
<i>emph.</i>	emphasised	<i>sug.</i>	suggested
<i>exp.</i>	explained	<i>sirt.</i>	suggested in relation to
<i>irt.</i>	in relation to	<i>tab.</i>	table
<i>perc.</i>	percentage		

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